

Note

In Erinnerung an den Zeilen-Drucker in einem Computer-System

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Synopsis: In this note many pictures are shown again which are calculated by one of the chaos equations and are printed by the NLP in Center for Information Science Kokushikan University. The use of this NLP will be discontinued beginning summer 1997. It means, that this note is the last printing, therefore a summarization about NLP is presented.

Dies wird wahrscheinlich die letzte Darstellung (Anwendung) des NLP-Druckers des Computer-Systems der Kokushikan-Universität sein. Das System wird im Oktober 1997 nach zehn-jährigem Einsatz durch ein neues System ersetzt. Das bedeutet, daß der NLP, welches Nihongo-Line-Printer (Zeilen-Drucker mit japanischen Buchstaben) bedeutet, nicht mehr zur Anwendung kommen wird.

Mit dem früher angewandten mechanischen Line Printer (LP) konnte man nicht alle japanischen (oder nicht-alphabetischen) Buchstaben drucken. Zum Beispiel konnte man bei der Benutzung des mechanischen LP nur alphabetische Buchstaben für Katakana-Zeichen anwenden. Dies geschah, indem die Katakana-Zeichen mit Kode-Nummern versehen wurden, die dann in der Rubrik der kleinen Buchstaben der europäischen Alphabets-Tabelle (Tabelle 1) angesiedelt wurden. In der so neuorganisierten Tabelle befinden sich somit die Katakana-Zeichen neben den großen alphabetischen Buchstaben (Tabelle 2), und gebrauchte sie so.

In der folgenden Entwicklung wurde die Laser-Technik für den Zeilen-Drucker (LP) angewandt, das heißt, daß man keine Druck-Typen-Zylinder im LP braucht, um alle Buchstaben mit dem LP zu drucken. Die Buchstaben werden mit dem Laserstrahl gestaltet und bilden somit die Fonts.

Anders als bei der mechanischen Funktion, in der ein entsprechender Drucktyp angeschlagen wird, um auf einem Papier eine Zeile zu drucken, ist der Laser-Zeilen-Drucker geräuschlos. Er hat sein eigenes Font-Generating-System. Ist das Font einer Sprache zum Beispiel: Japanisch oder Thai im LP installiert, so kann sie auch ohne den Umweg über das Alphabet dargestellt werden. Werden Fonts nicht nur durch Bit-images, sondern auch durch Outline-Darstellungen gebildet, so lassen sich die Größe des Fonts proportionsmäßig drucken. Das weiteren kann man mit diesem Image-Druck graphische Darstellungen durch den NLP zeichnen.

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Der Verfasser der vorliegenden Arbeit zeigte bisher viele Chaos-Bilder^{1),2),3)}, die mit dem NLP gedruckt wurden. In dieser Arbeit wird auch die Chaos-Bilder Data-Base gezeigt, die nicht serienmäßig ist, sondern auch eine Dokumentation des NLP der Kokushikan-Universität. Herrn Prof. Kokame sei im Namen des Zentrums für die Informations Wissenschaft für seine Arbeit: CAGRAK vielmals gedankt. Mit dieser Hilfe konnten die Chaos-Bilder durch NLP dargestellt werden, und dies hatte für graphische Darstellungen in vielen Diplomarbeiten Anwendung gefunden.

Computer-Systeme ändern sich ständig und werden immer weiter entwickelt. So ist zum Beispiel das frühere System des Host-Computer durch das Netzwerk (network) der workstation ersetzt worden. Das hat zur Folge, daß das NLP nicht mehr im System integriert ist. Stattdessen wurde der Drucker des heutigen PS (PostScript)-System beliebt. Nur ein LP hat wie der Host-Computer, mehreren Benutzern seinen Service gegeben. Der neue Drucker aber ist durch ein workstation (Printer-Server) kontrolliert und seine Kapazität ist nicht so groß wie die des LP. Mehrere Drucker am Netzwerk sind deshalb wichtig. In der praktischen Anwendung war der LP sehr ratsam für den Unterricht, in dem ca. 50-80 Studenten das Programmieren üben mußten. Sein Output war kurz und schnell (Maximum-Wert 2000 Zeilen/Min.). Eine weitere Veränderung fand auch beim Papier statt. Anstatt des ehemaligen durchlaufenden Papiers, werden jetzt DIN A4 Größe oder in bestimmtem Format gechnittene Papierbogen verwandt.

Tabelle 1 und 2 zeigen EBCDIC (Enhanced Binary Code Decimal Information Change) mit kleinen alphabetischen Buchstaben (Tabelle 1) und Kanatakana (Tabelle 2). Die folgenden Bilder sind Chaos-Darstellungen.

Hier stellt der Verfasser wieder viele Chaos-Bilder dar. Die Bilder werden durch folgende Gleichungen berechnet.

$$x_{n+1} = y_n + ax_n + \frac{5}{1 + x_n^2} + c \quad (1)$$

$$y_{n+1} = x_n \quad (2)$$

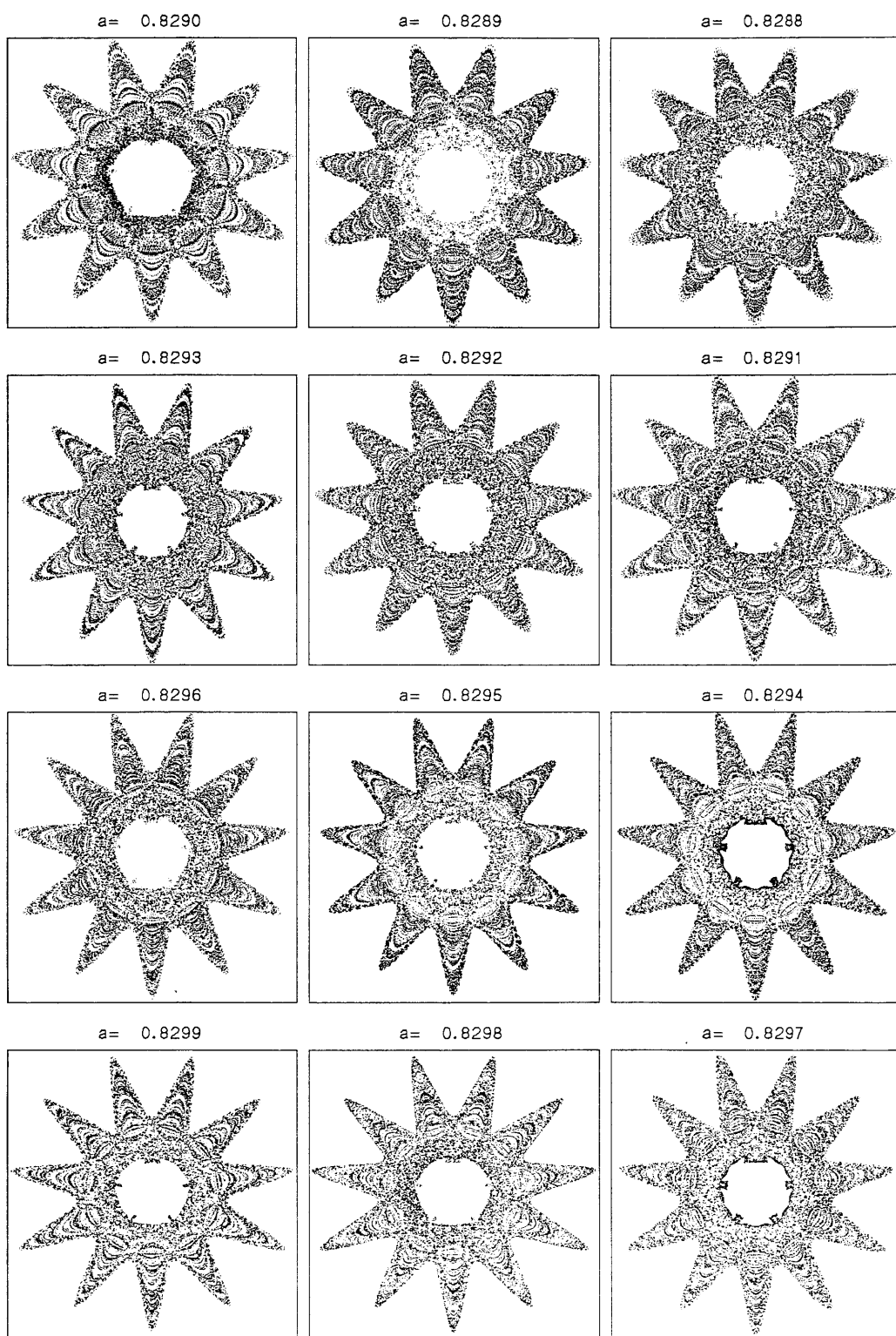
Diese Gleichungen werden deshalb gewählt, weil der Verfasser die Bilder ohne Parameter (d.h. $c=0$) in Gl. (1) gezeigt hat¹⁾. Auch sind die Bilder unter der Bedingung $c=10$ und $c=-10$ berechnet worden.²⁾ Die Bilder werden mit konsekutivem Wert des Parameters $a=0,7901 \sim 0,8299$, $c=10$ berechnet. Jedes Bild wird zwischen maximalen und minimalen Wert gezeigt, die von 30.000 Punkte gewählt werden. Jeder Wert a wird auf jedem Bild angezeigt. Die Zuwachsrates a ist 0,0001. Die Bilder sind nicht numeriert, weil alle Bilder in einer Database zusammengefaßt sind, und man sie mit dem auf jedem Bild ausgedruckten Wert a unterscheiden kann. Die bildmäßigen Betrachtungen zeigen uns durch die Arbeit mehrere vorherige Variationen und Aufbreitungen im quadratischen Bereich. Der Unterschied zwischen Zuwachsrates a zeigt ein interessantes Phänomen d.h. die Bilder haben alle unterschiedliche Figuren.

Tafel 1

	4	5	6	7	8	9	A	B	C	D	E	F
0	SP	&	—						{	}	\$	0
1			/		a	j			A	J		1
2					b	k	s		B	K	S	2
3					c	l	t		C	L	T	3
4					d	m	u		D	M	U	4
5					e	n	v		E	N	V	5
6					f	o	w		F	O	W	6
7					g	p	x		G	P	X	7
8					h	q	y		H	Q	Y	8
9					i	r	z		I	R	Z	9
A	€	!		:								
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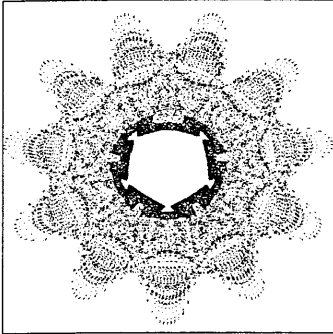
Tafel 2

	4	5	6	7	8	9	A	B	C	D	E	F
0	SP	&	—			ソ			{	}	\$	0
1	。	エ			ア	タ			A	J		1
2	「	オ			イ	チ	ヘ		B	K	S	2
3	」	ヤ			ウ	ツ	ホ		C	L	T	3
4	、	ユ			エ	テ	マ		D	M	U	4
5	・	ヨ			オ	ト	ミ		E	N	V	5
6	ヲ	ッ			カ	ナ	ム		F	O	W	6
7	ア				キ	ニ	メ		G	P	X	7
8	イ				ク	ヌ	モ		H	Q	Y	8
9	ウ				ケ	ネ	ヤ		I	R	Z	9
A	€	!		:	コ	ノ	ユ	レ				
B	.	¥	,	#				ロ				
C	<	*	%	@	サ		ヨ	ワ				
D	()	_	'	シ	ハ	ラ	ン				
E	+	;	>	=	ス	ヒ	リ	”				
F		¬	?	”	セ	フ	ル	°				

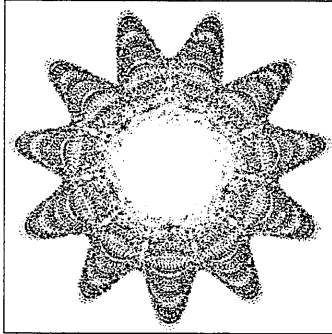


In Erinnerung an den Zeilen-Drucker in einem Computer-System

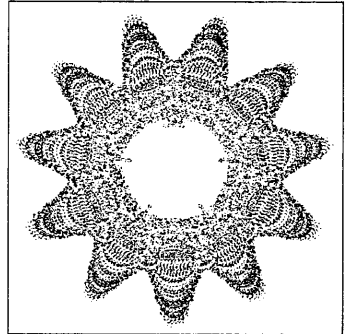
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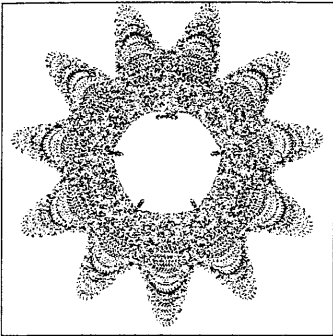
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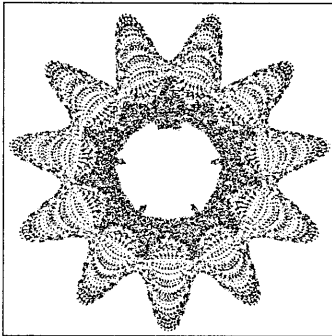
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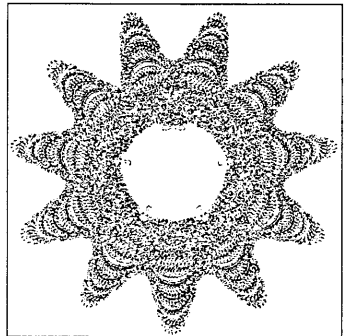
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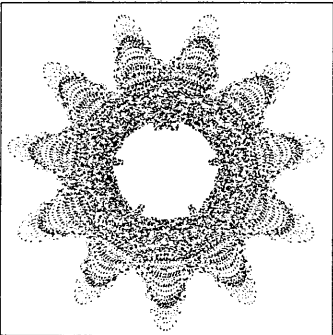
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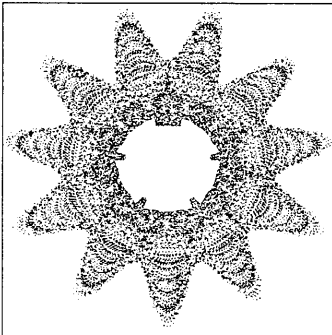
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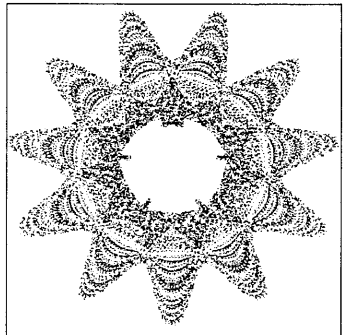
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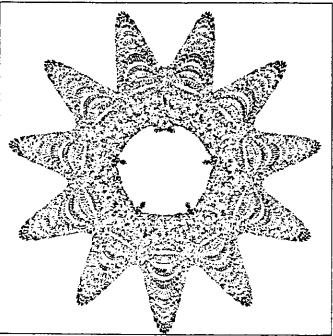
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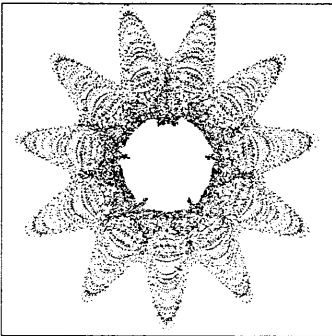
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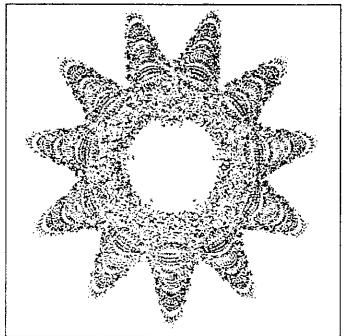
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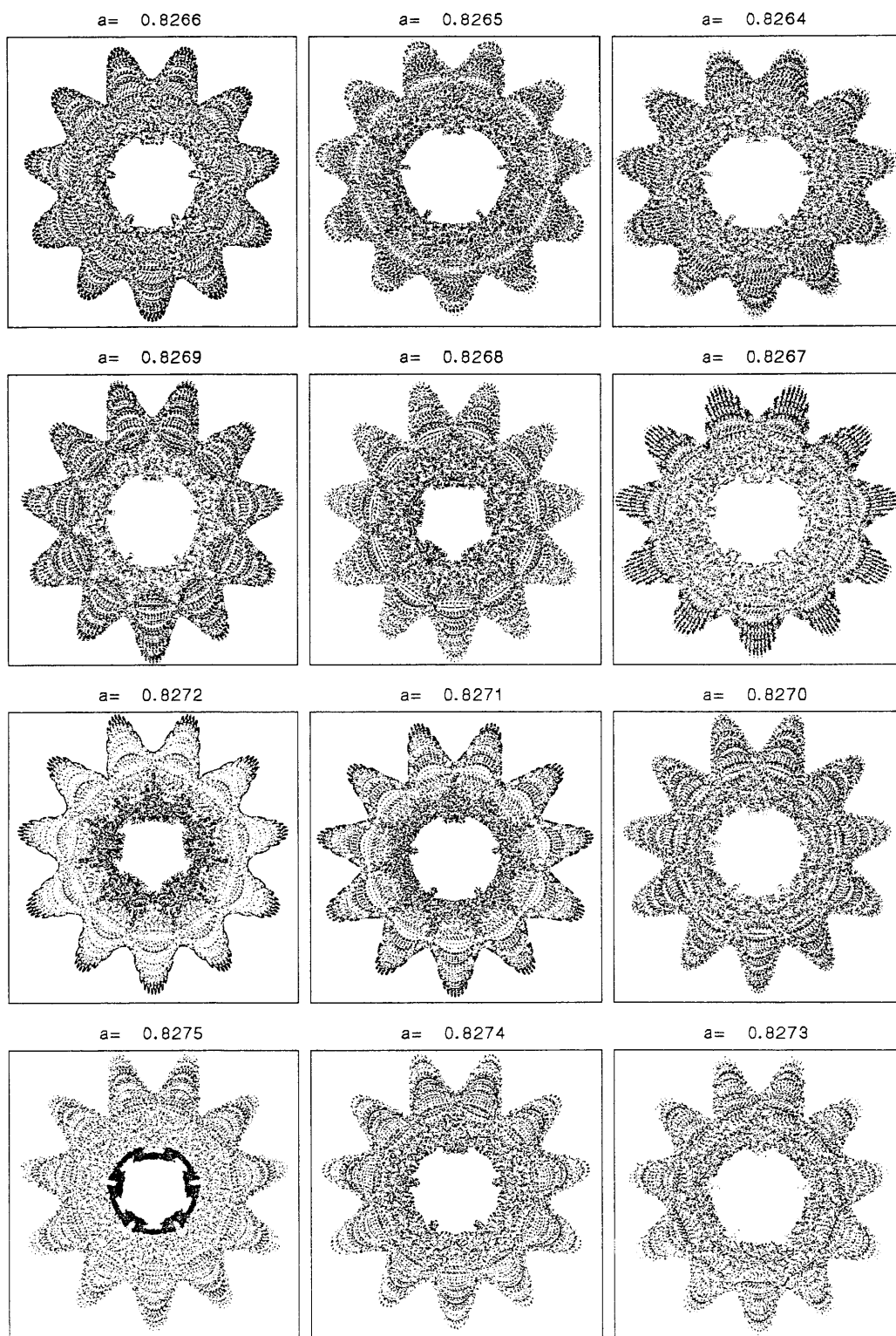


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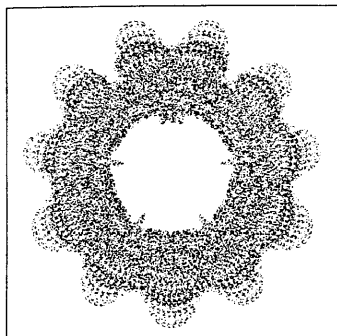
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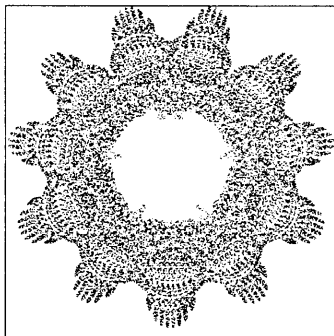


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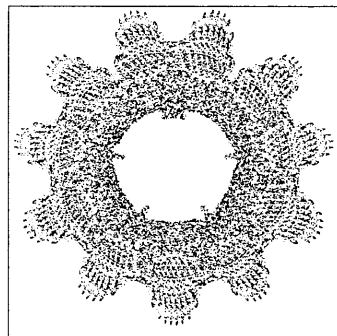
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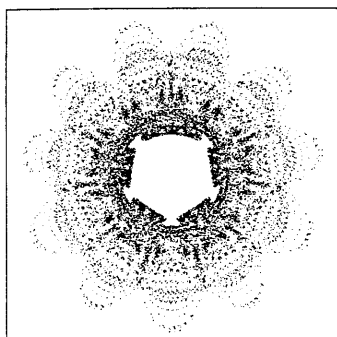
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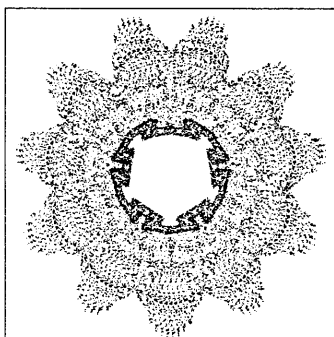
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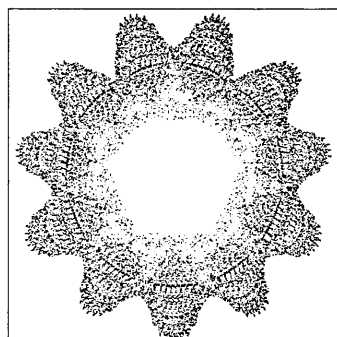
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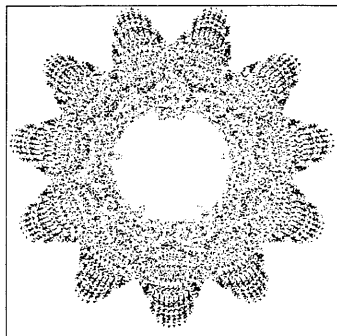
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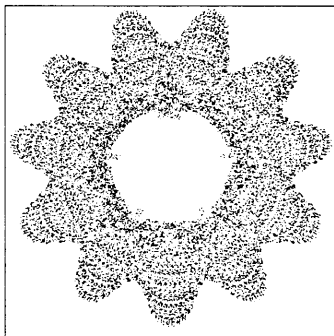
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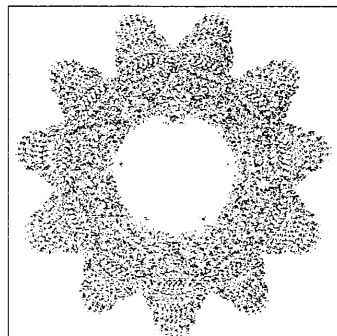
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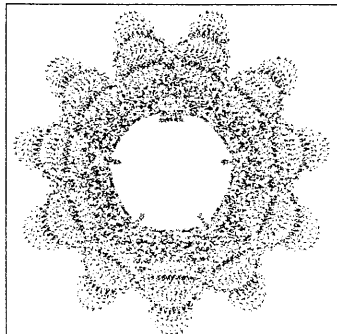
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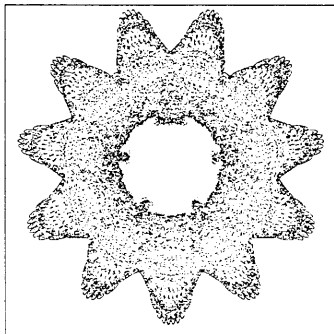
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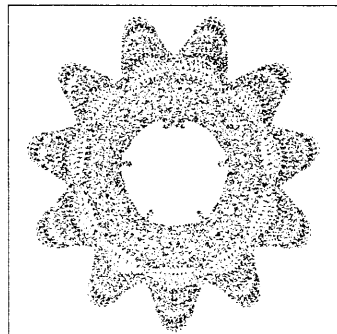
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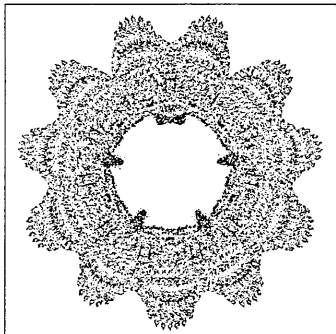
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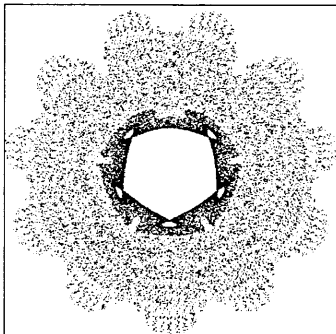
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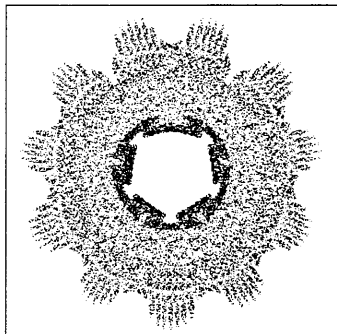
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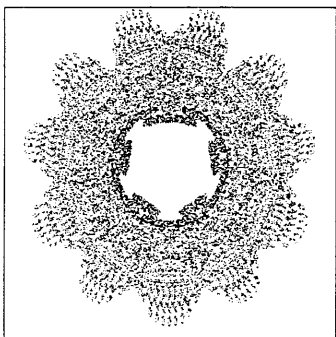
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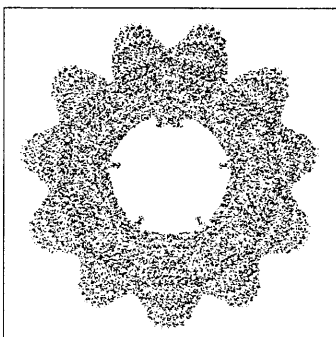
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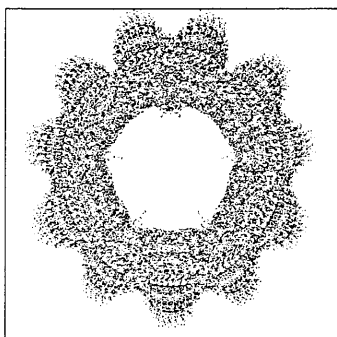
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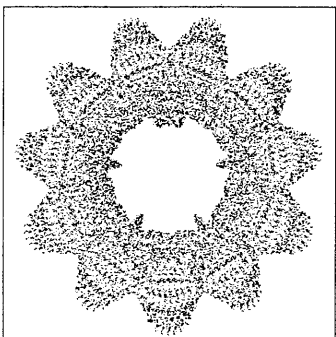
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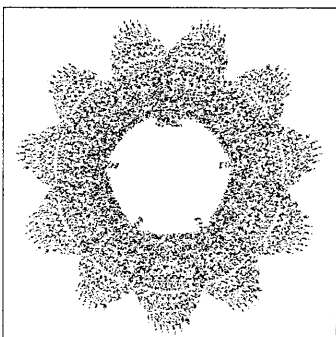
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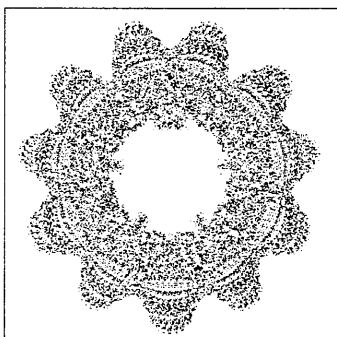
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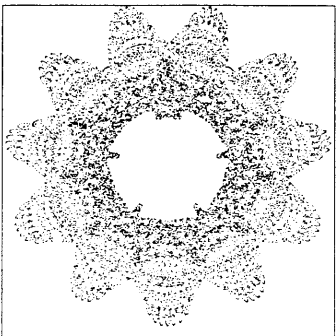
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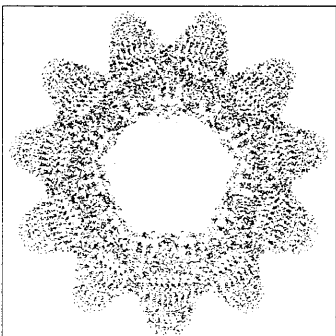
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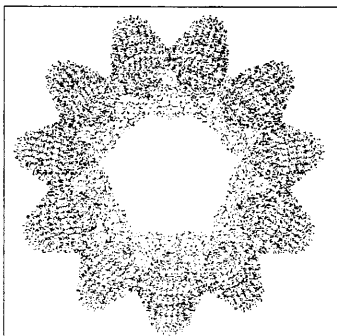
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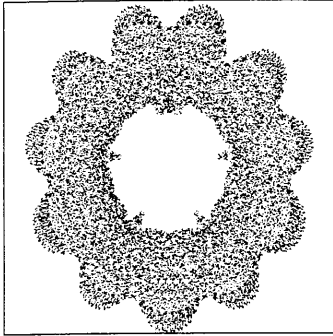


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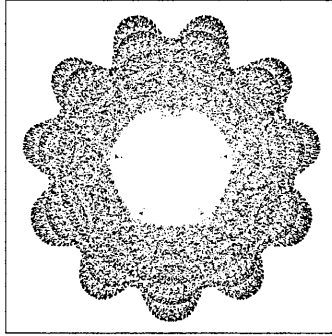


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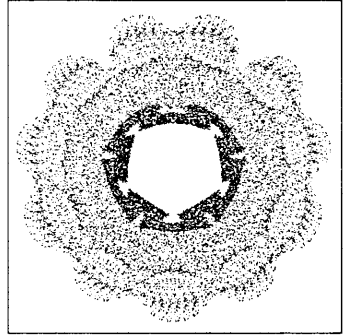
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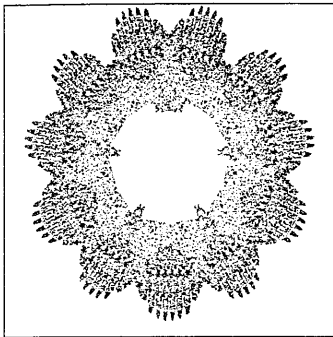
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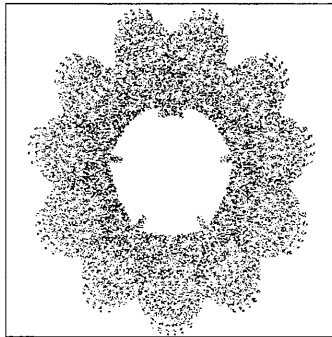
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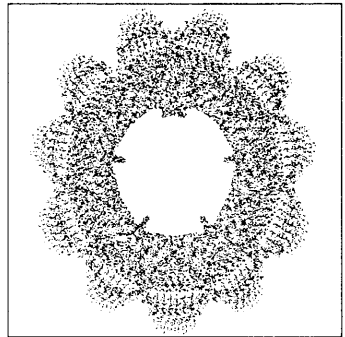
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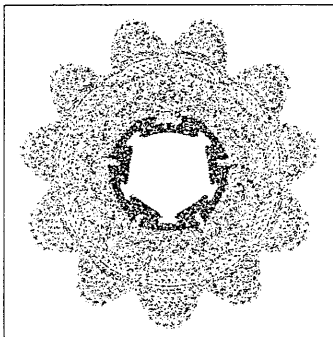
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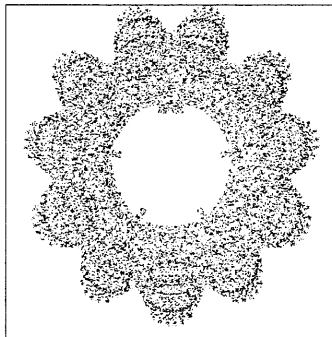
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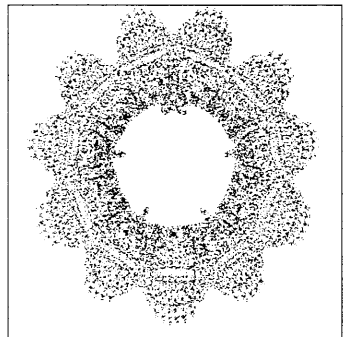
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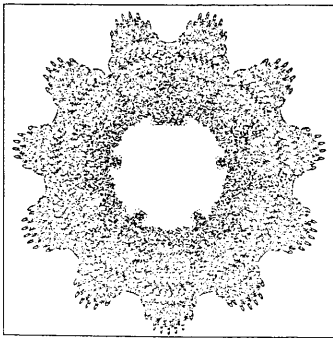
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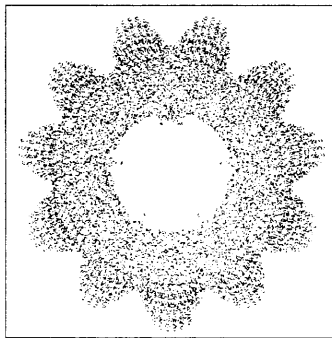
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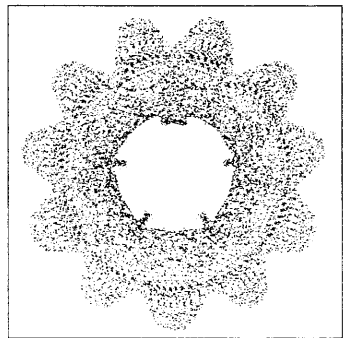
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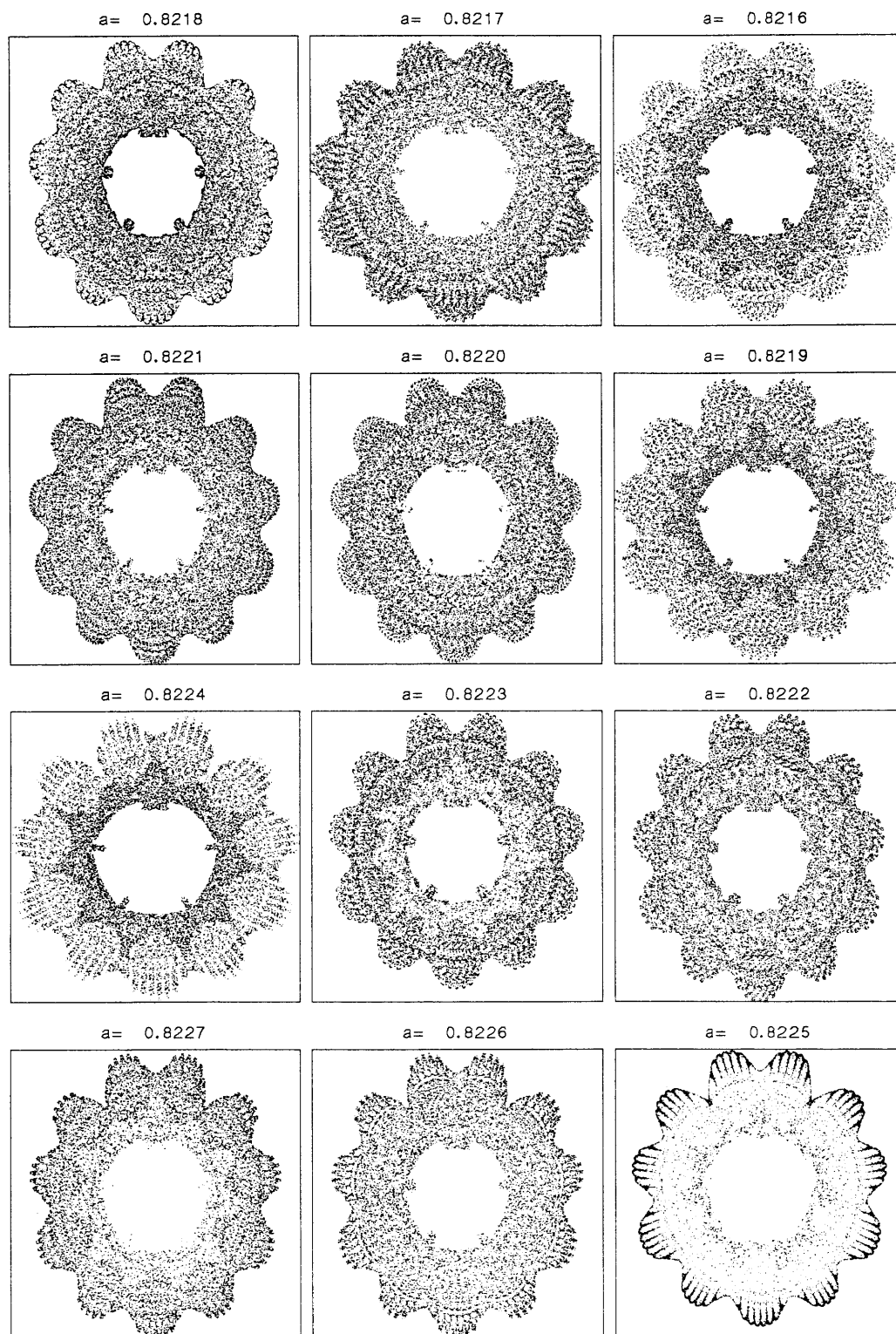


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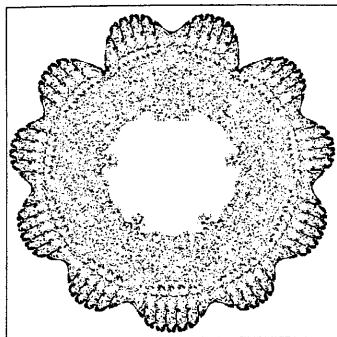
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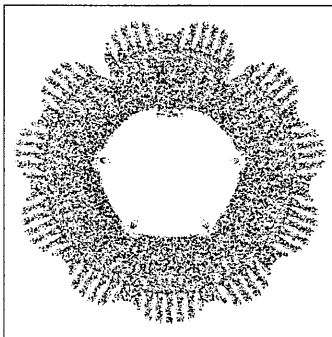


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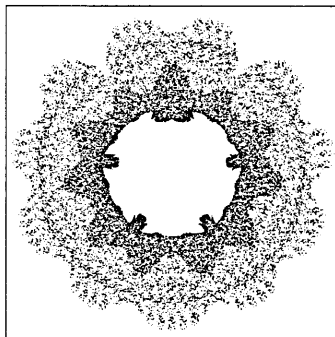
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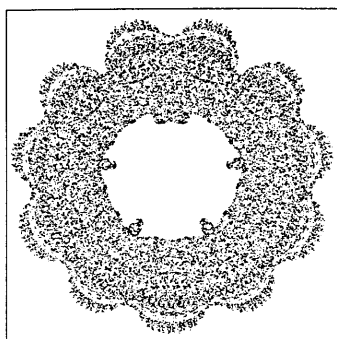
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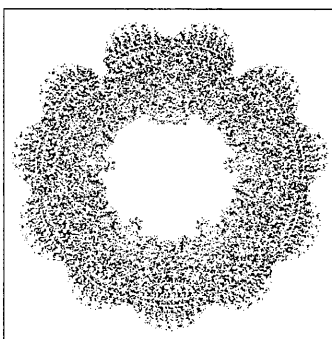
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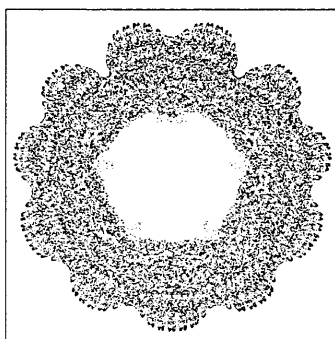
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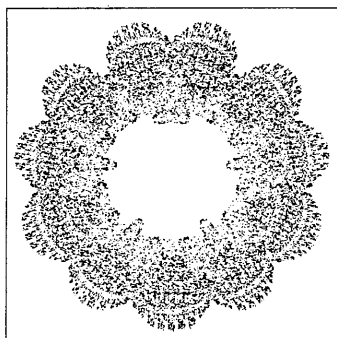
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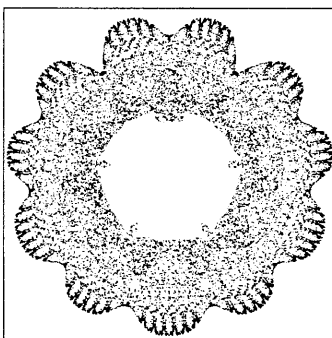
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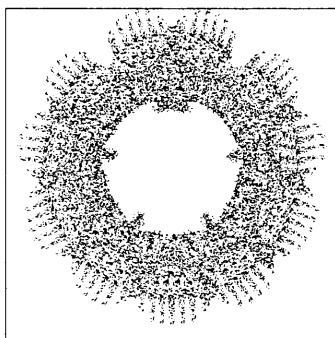
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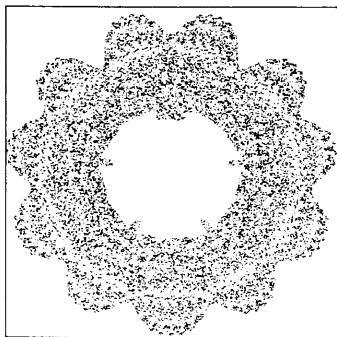
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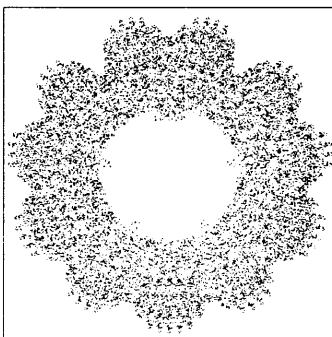
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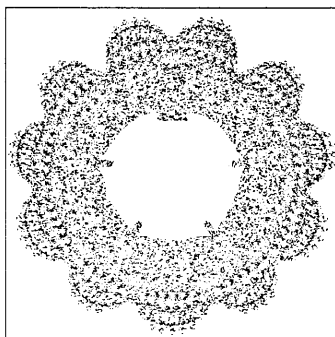
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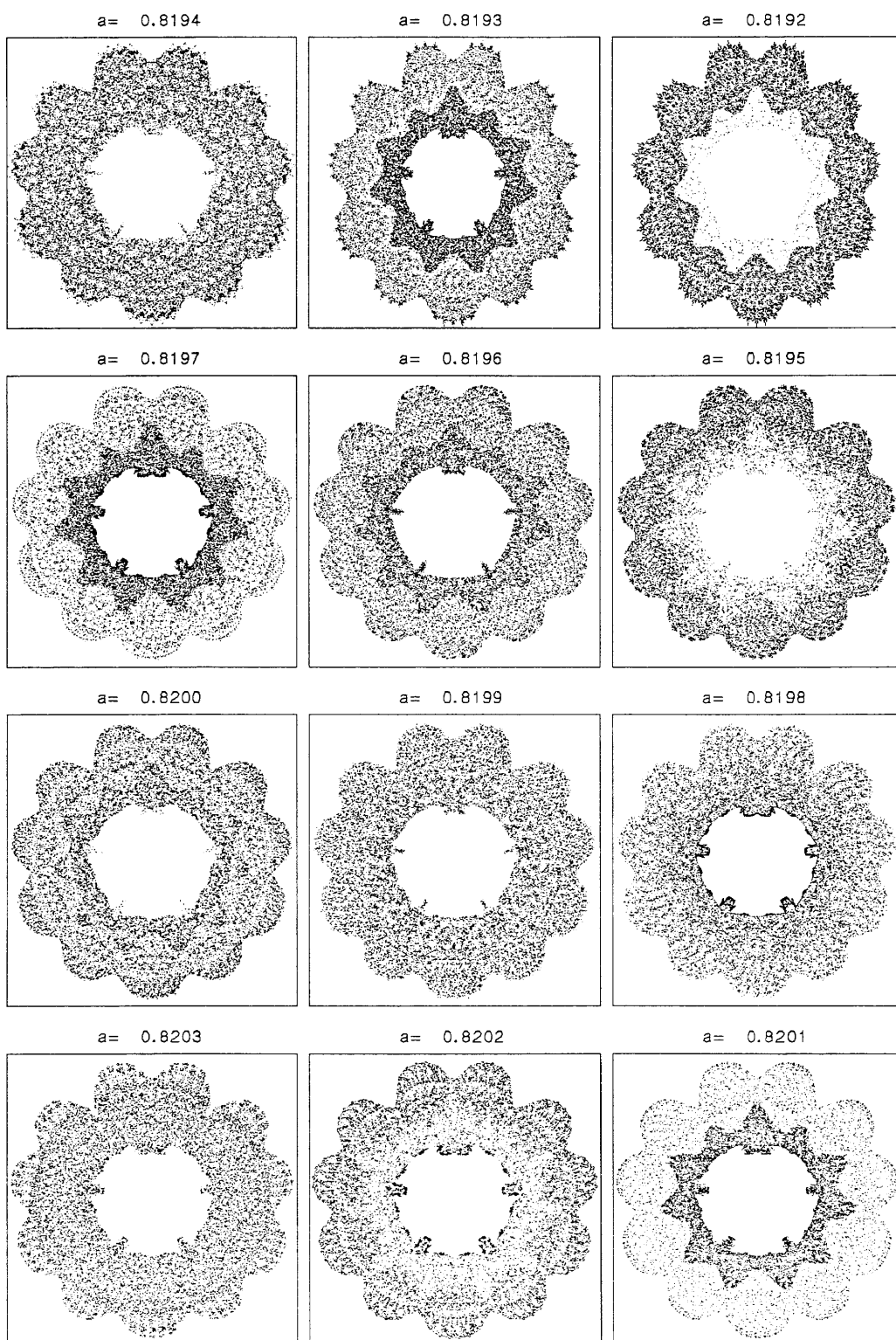


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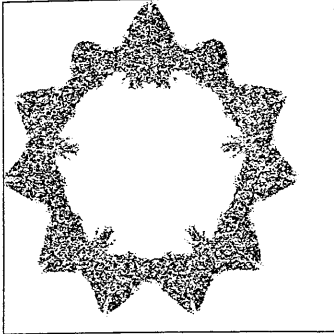
$a = 0.8213$



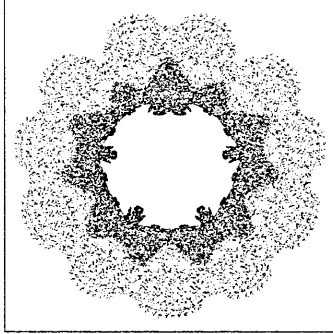


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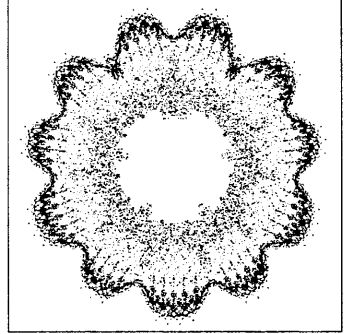
$a = 0.8182$



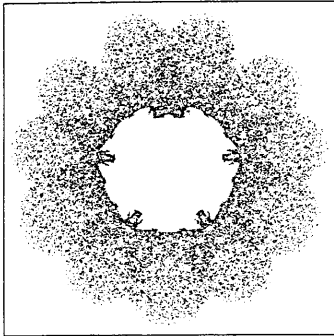
$a = 0.8181$



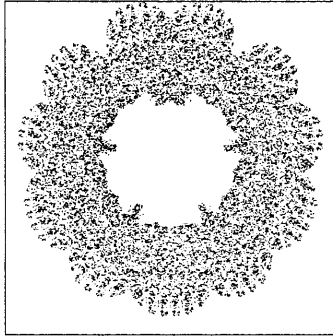
$a = 0.8180$



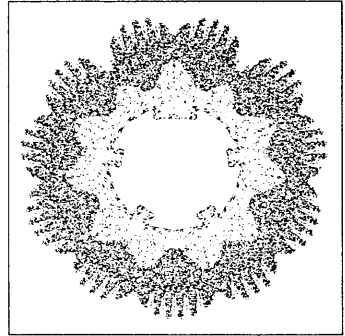
$a = 0.8185$



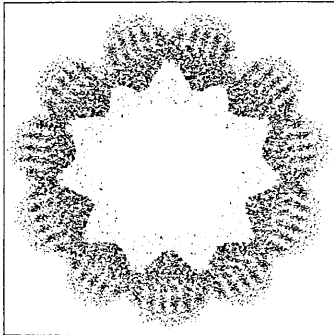
$a = 0.8184$



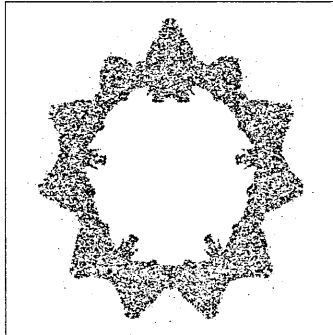
$a = 0.8183$



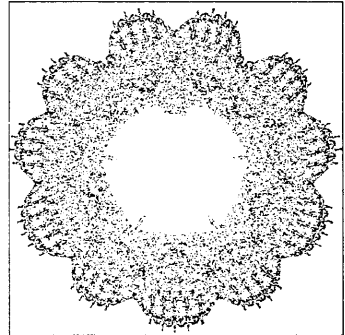
$a = 0.8188$



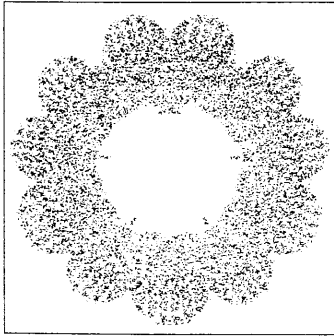
$a = 0.8187$



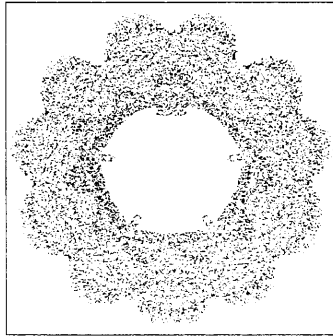
$a = 0.8186$



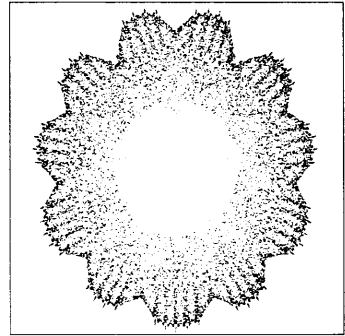
$a = 0.8191$

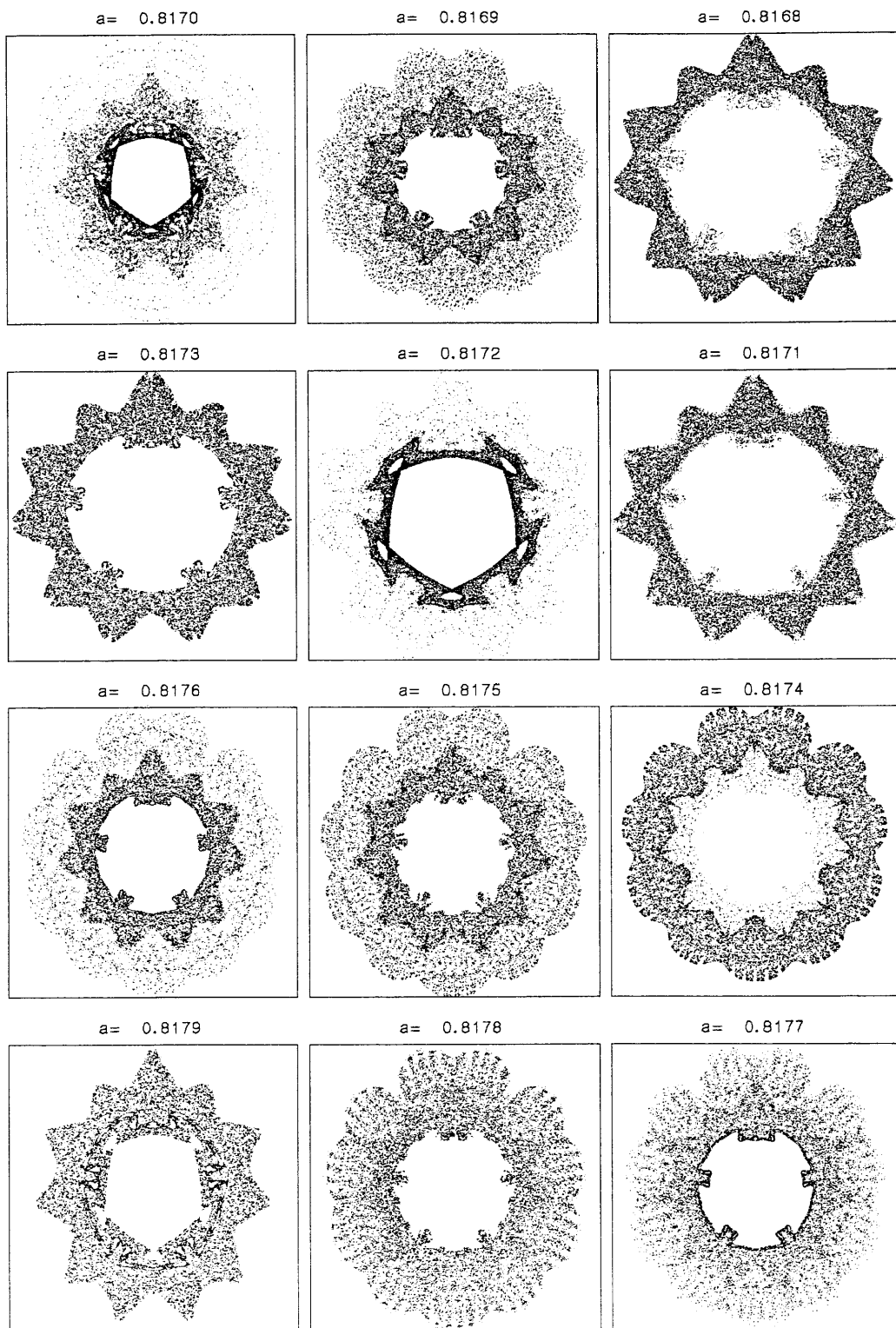


$a = 0.8190$



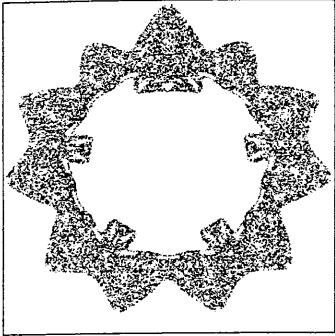
$a = 0.8189$



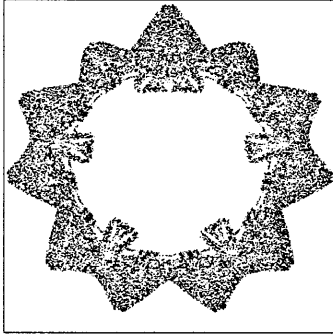


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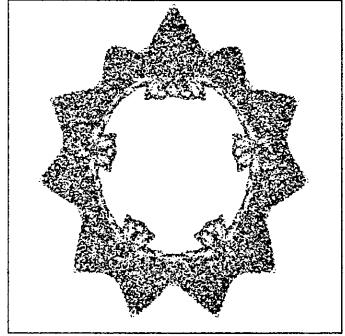
$a = 0.8158$



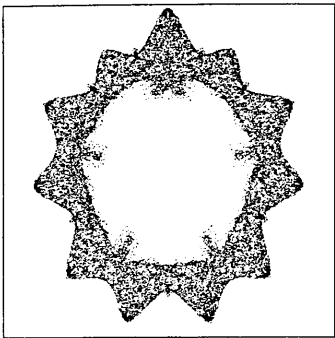
$a = 0.8157$



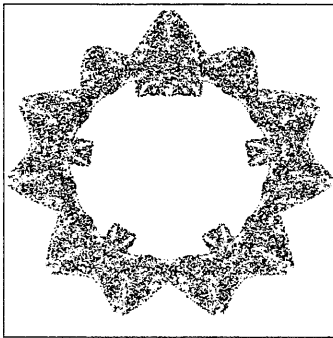
$a = 0.8156$



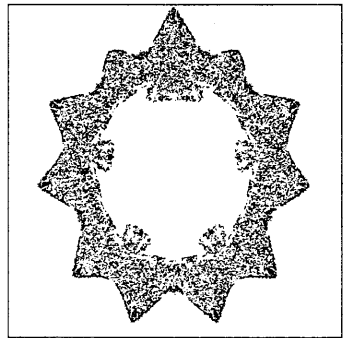
$a = 0.8161$



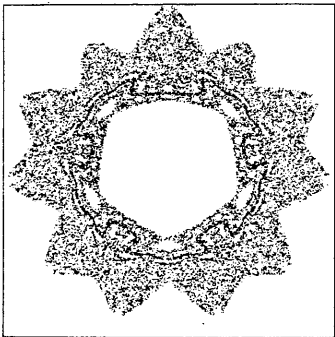
$a = 0.8160$



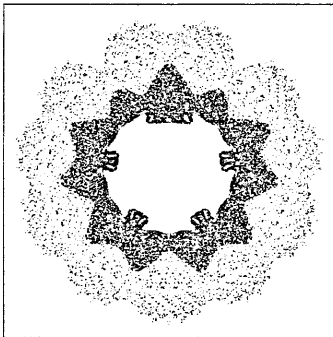
$a = 0.8159$



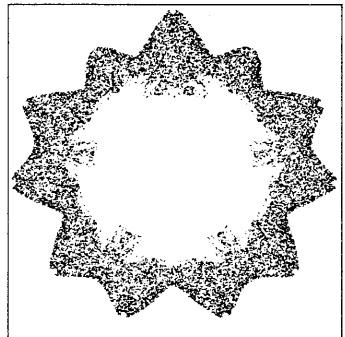
$a = 0.8164$



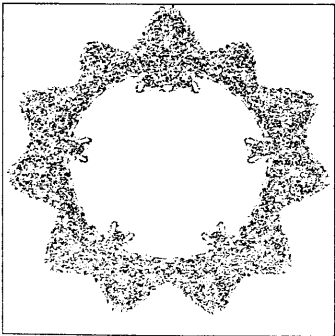
$a = 0.8163$



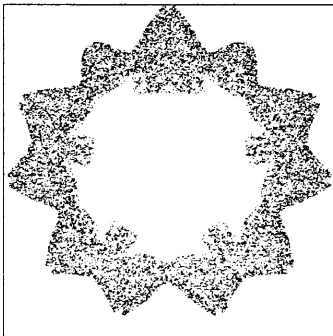
$a = 0.8162$



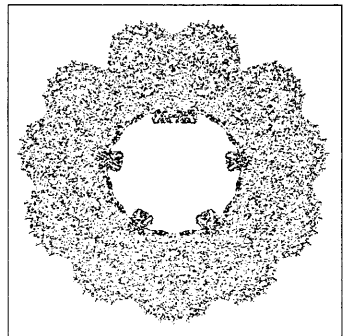
$a = 0.8167$

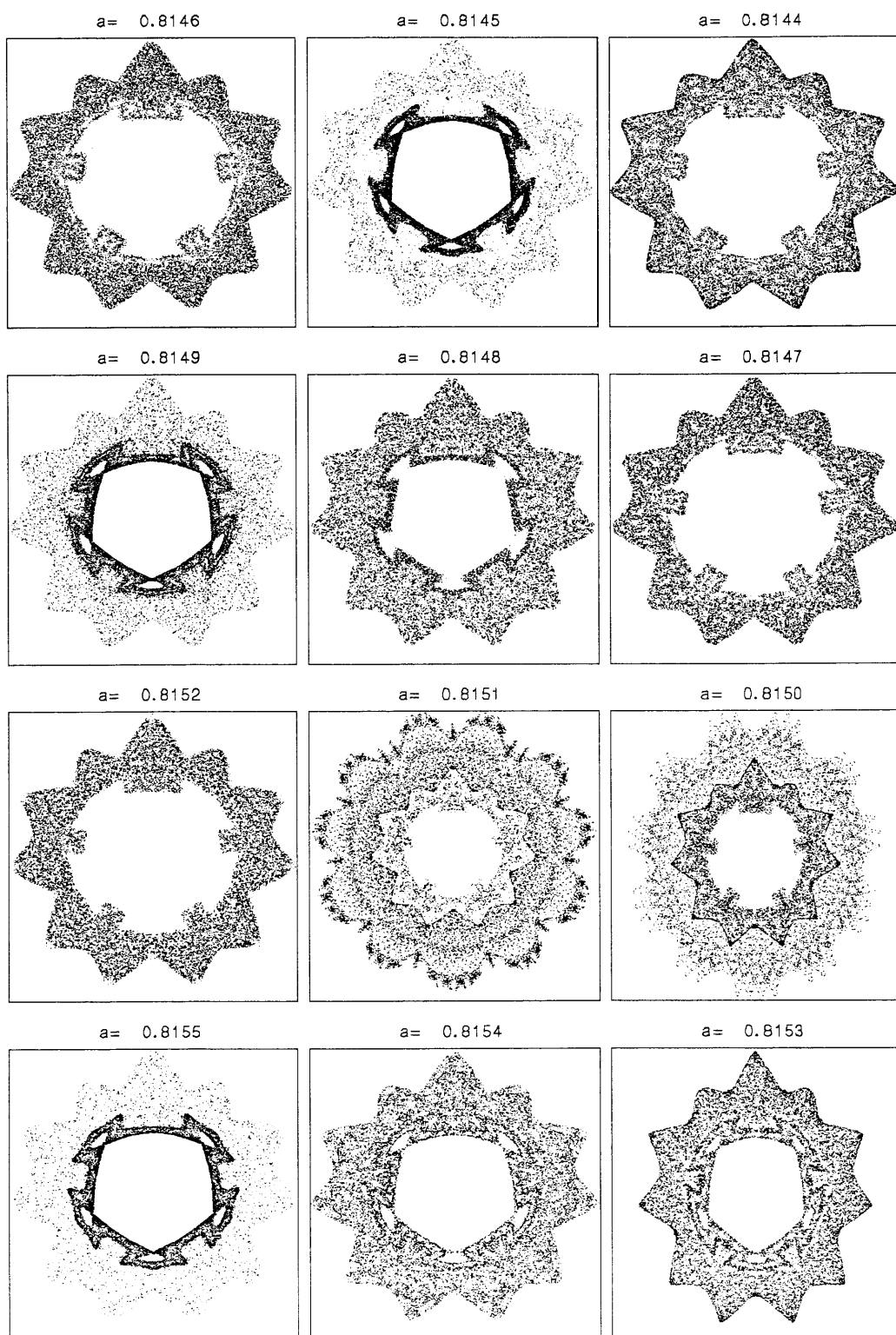


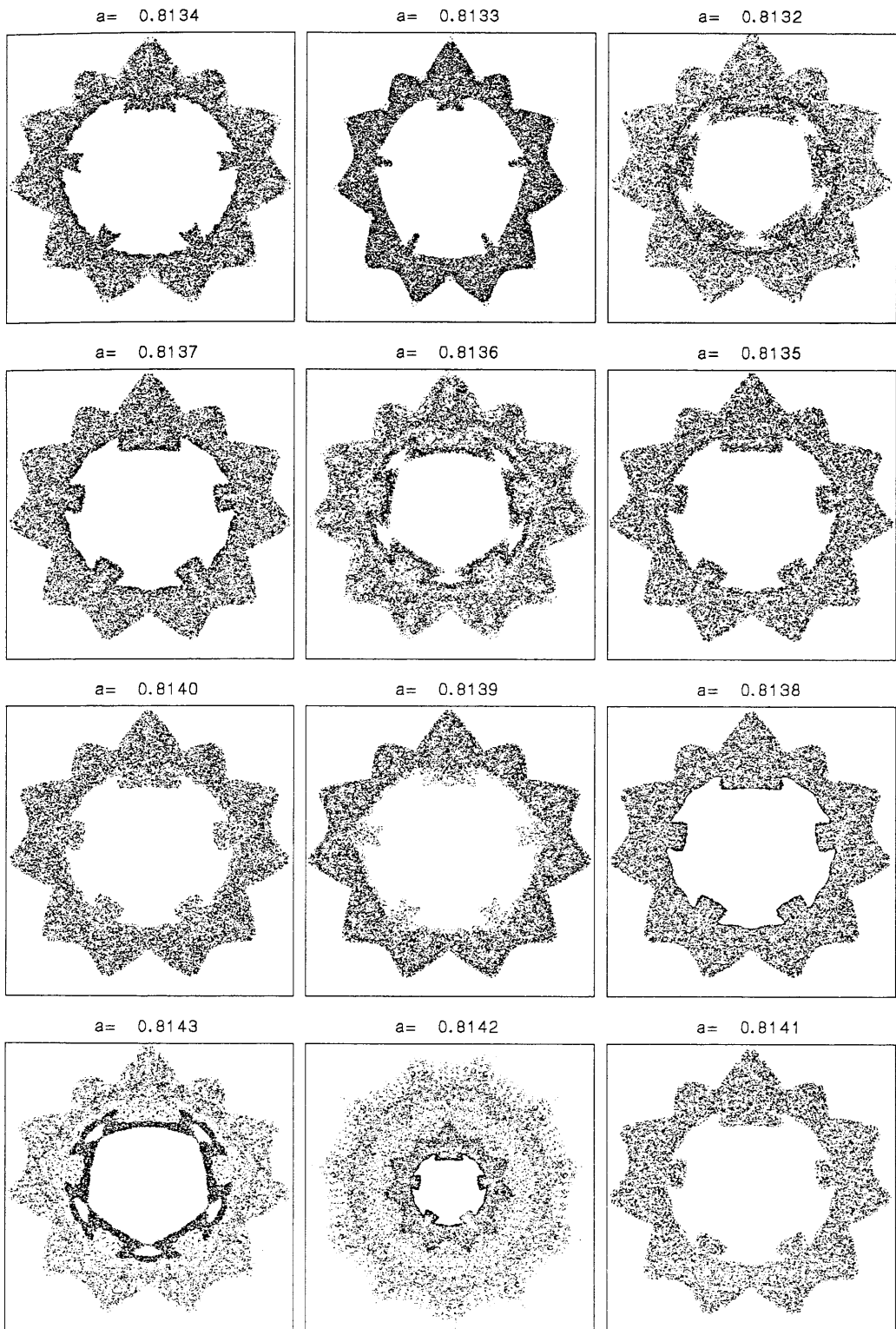
$a = 0.8166$

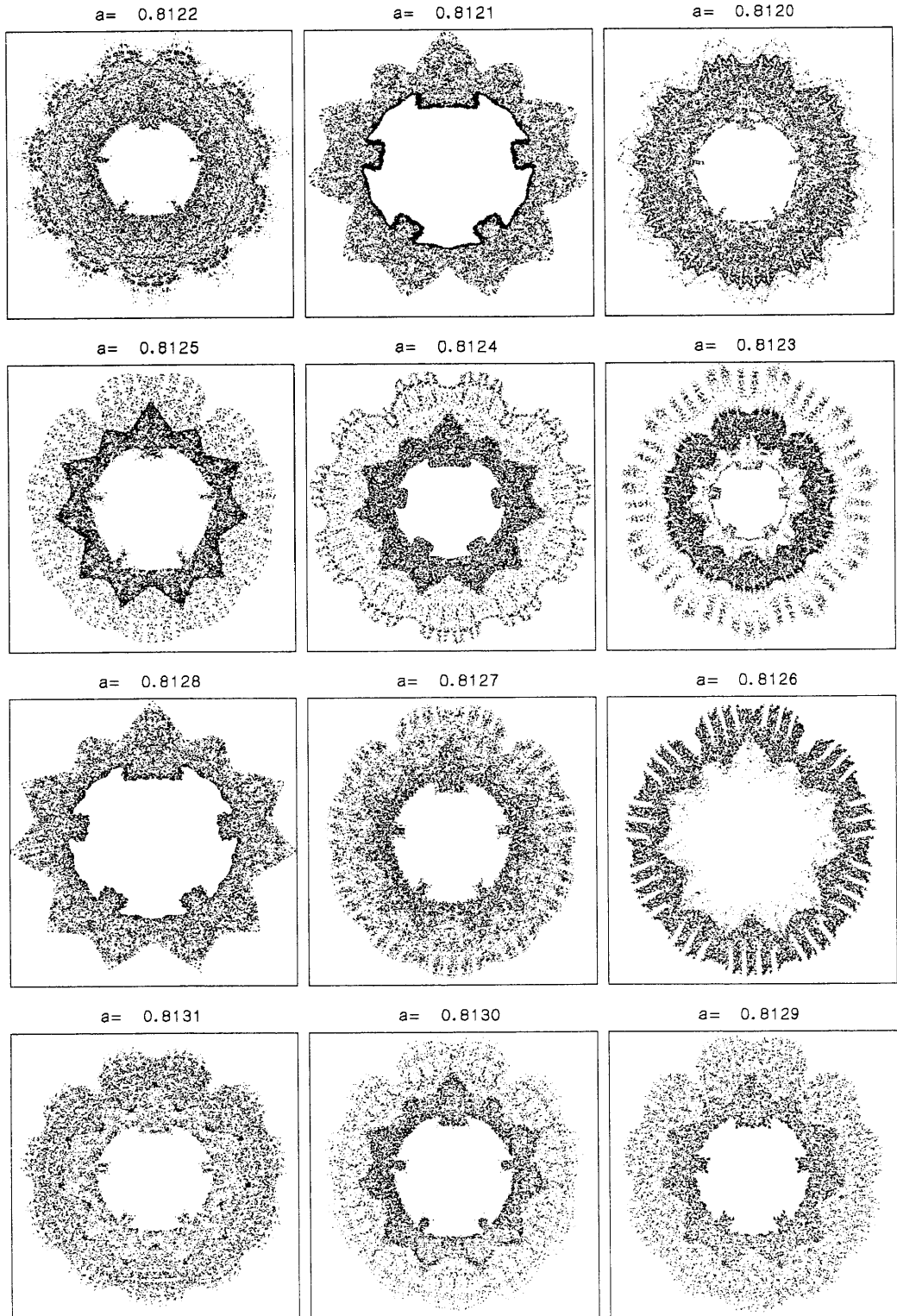


$a = 0.8165$



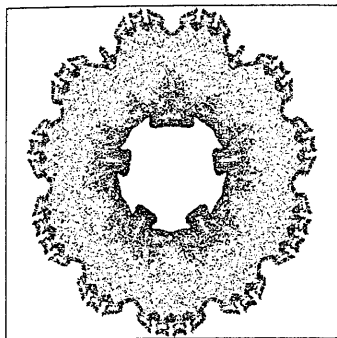




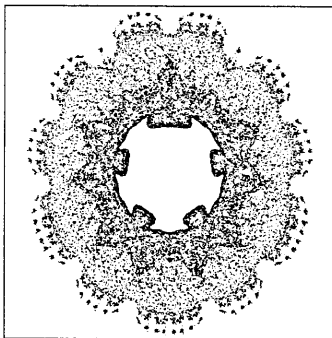


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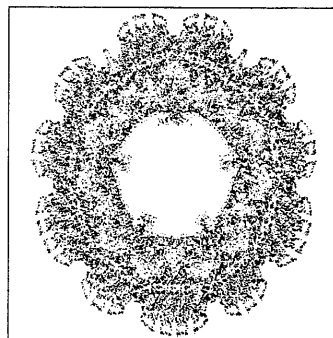
$a = 0.8110$



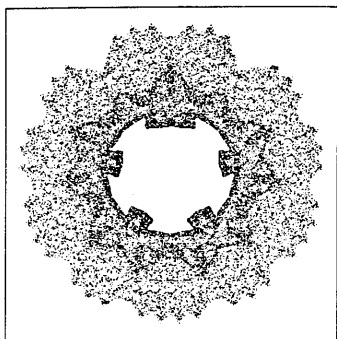
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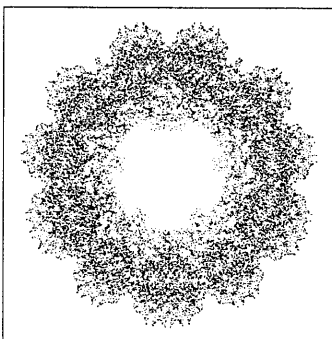
$a = 0.8108$



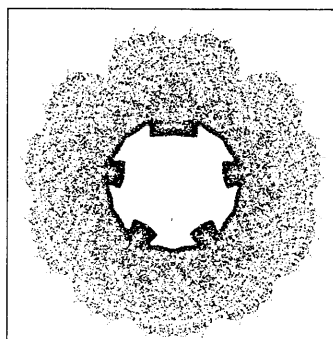
$a = 0.8113$



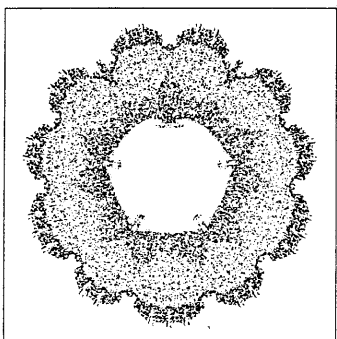
$a = 0.8112$



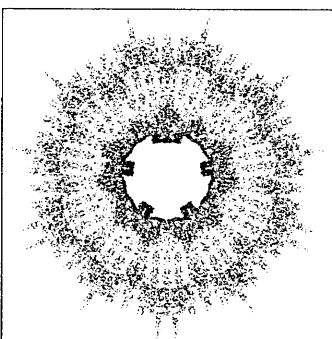
$a = 0.8111$



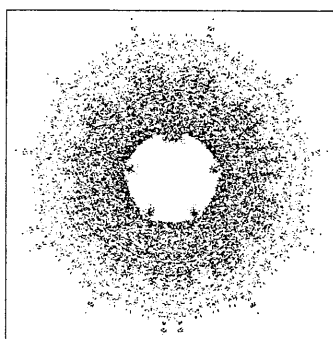
$a = 0.8116$



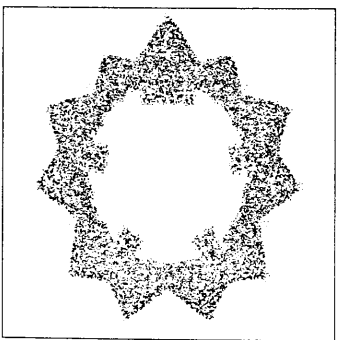
$a = 0.8115$



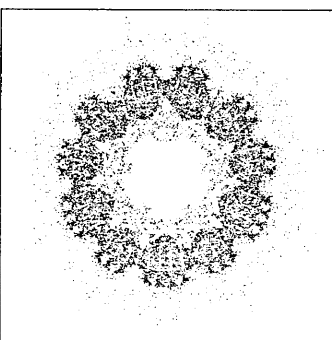
$a = 0.8114$



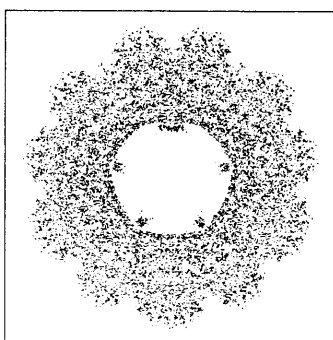
$a = 0.8119$

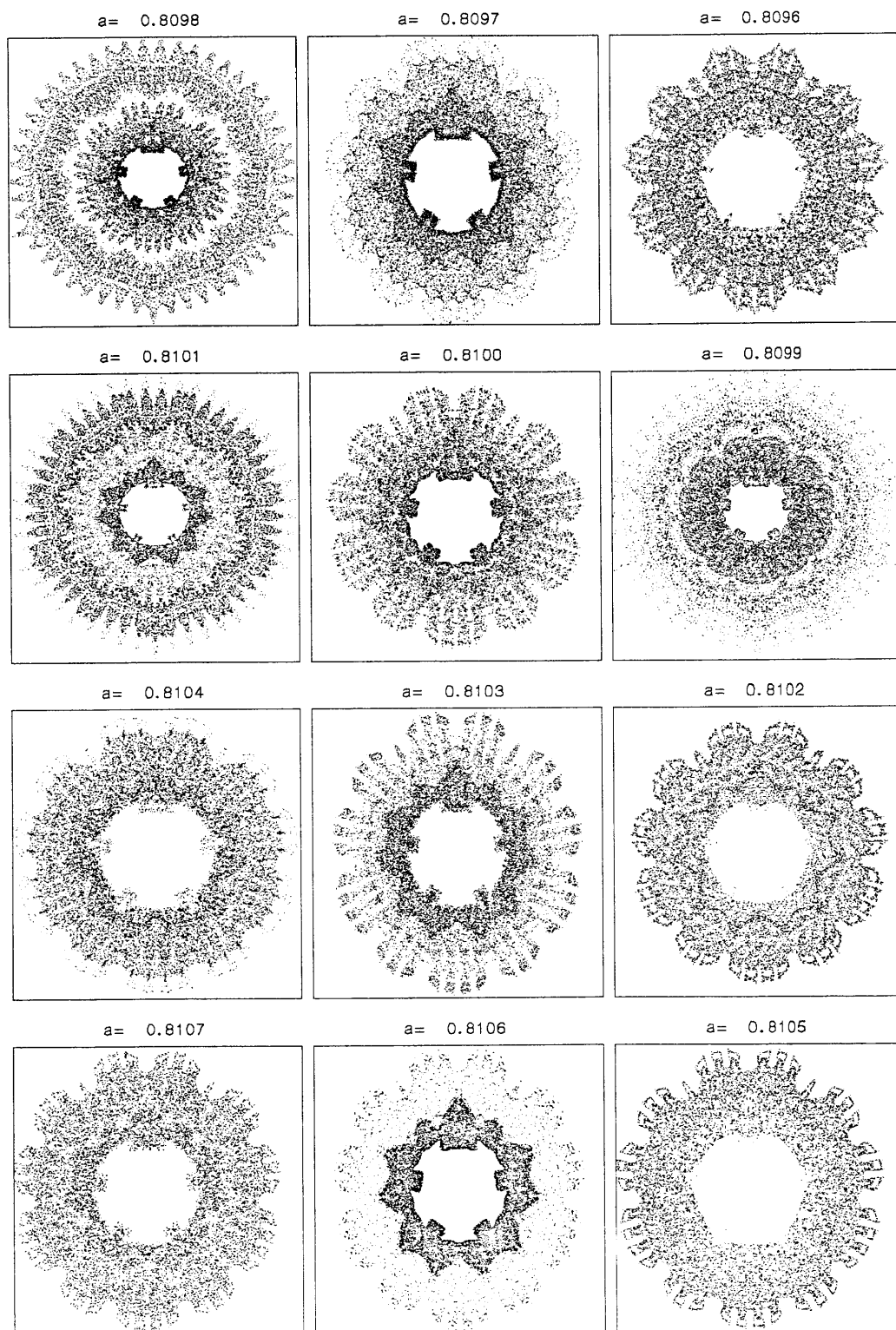


$a = 0.8118$

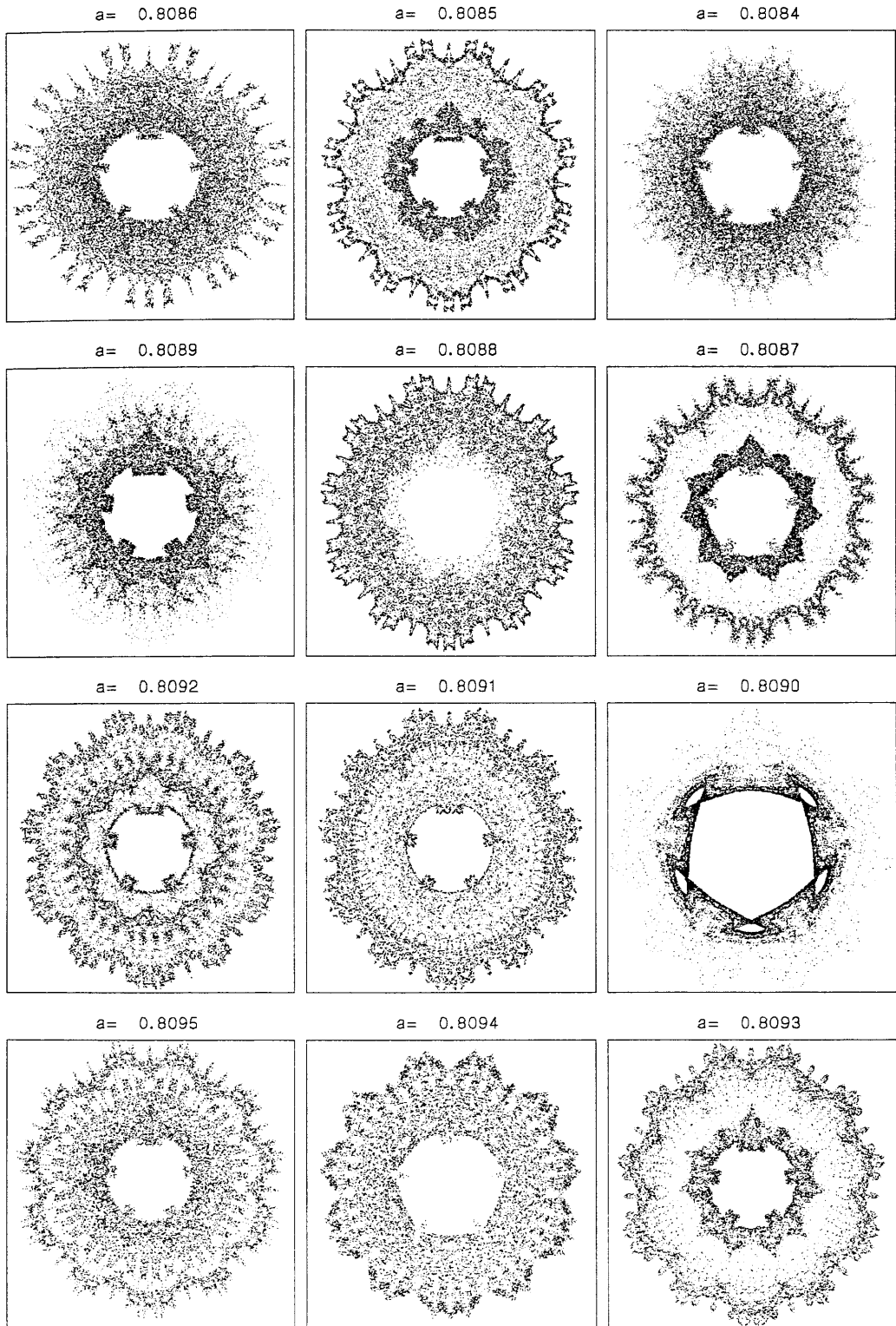


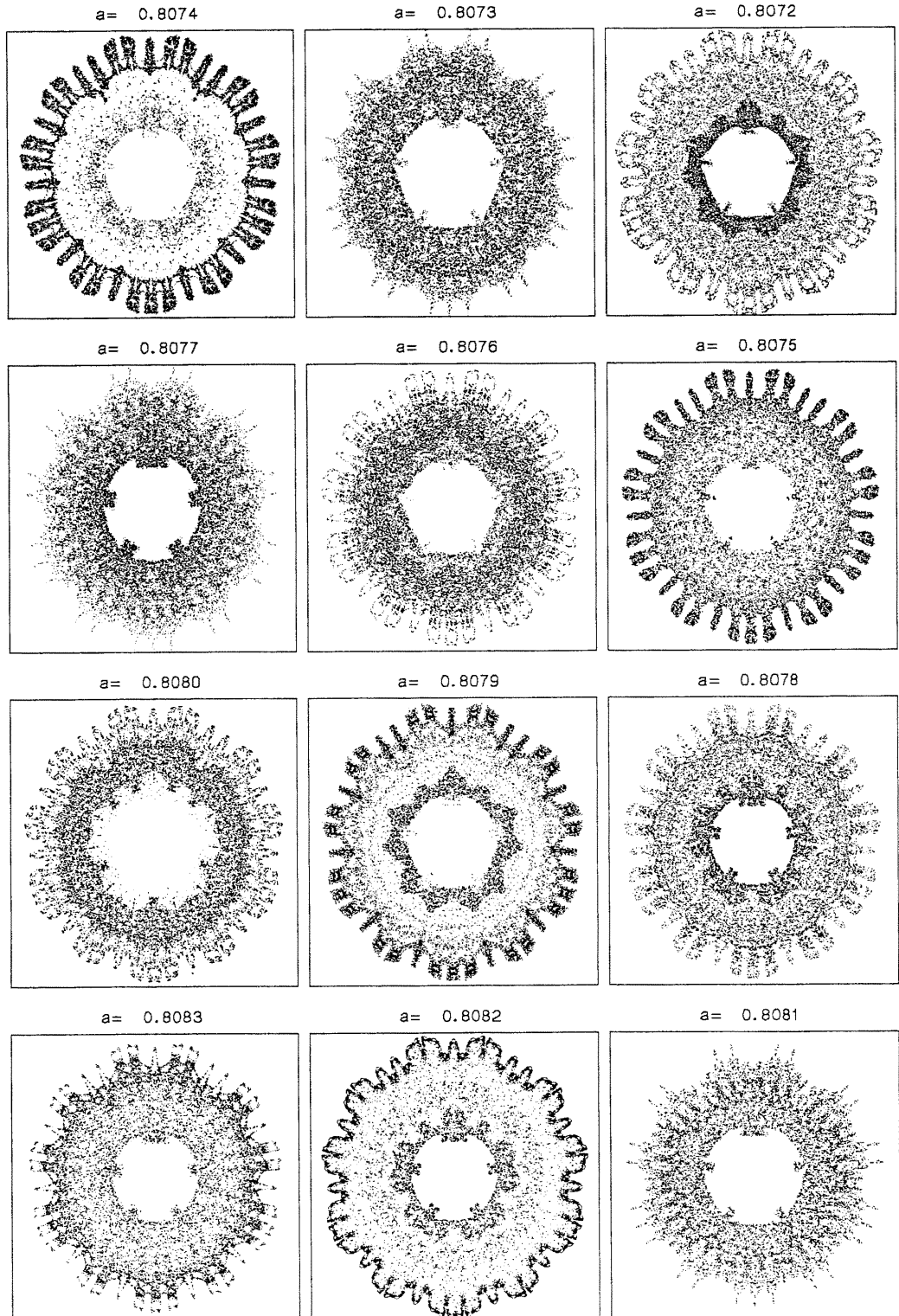
$a = 0.8117$



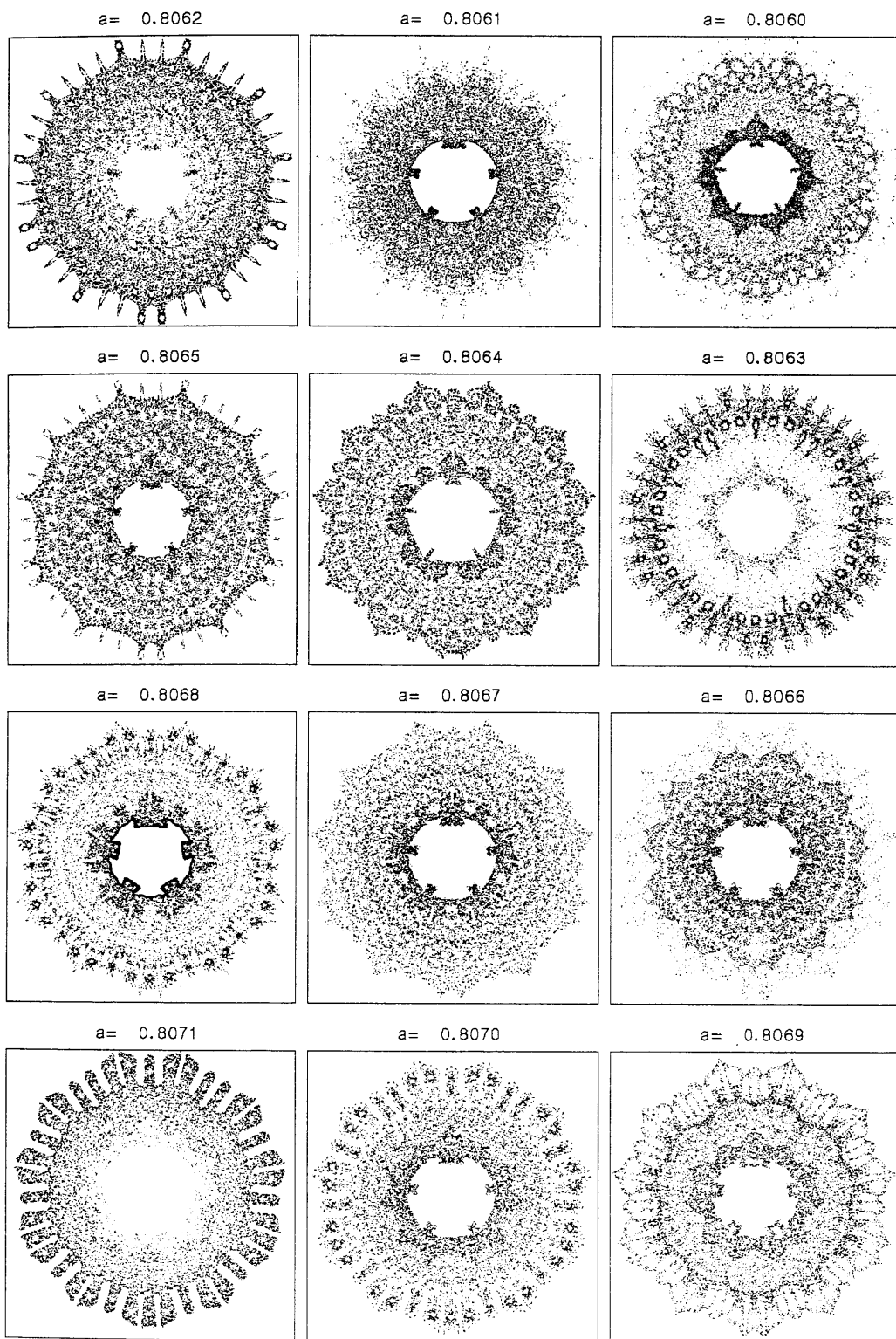


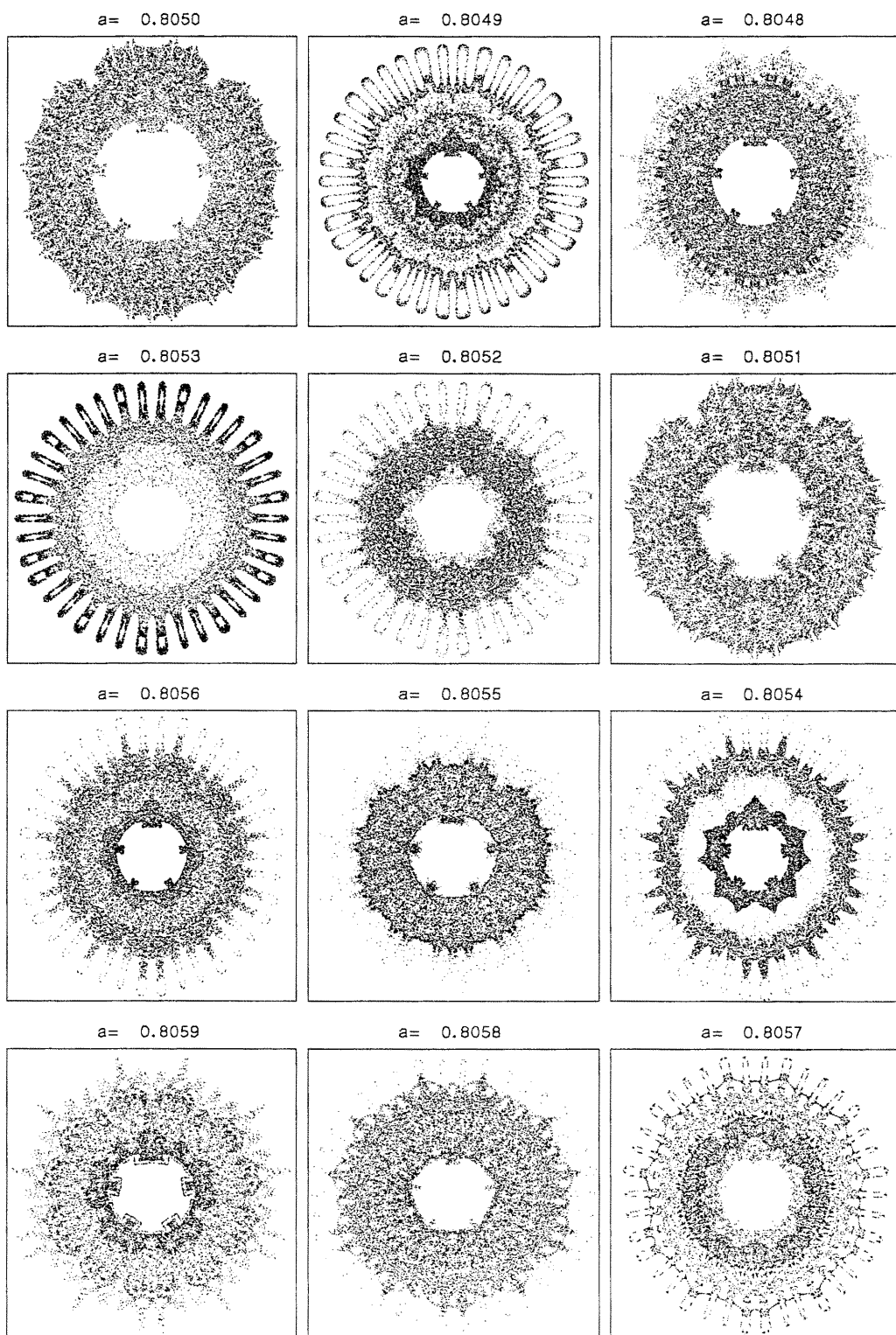
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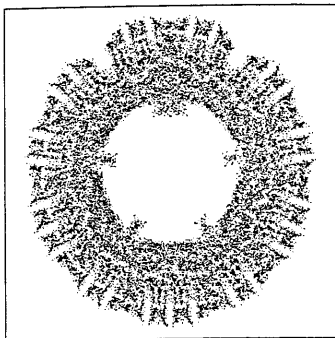
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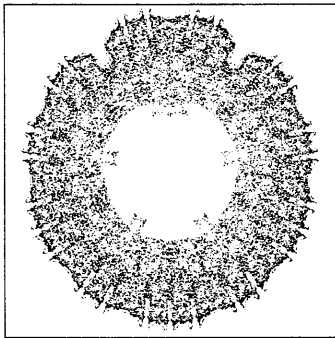


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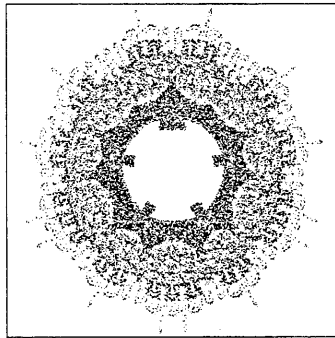
$a = 0.8038$



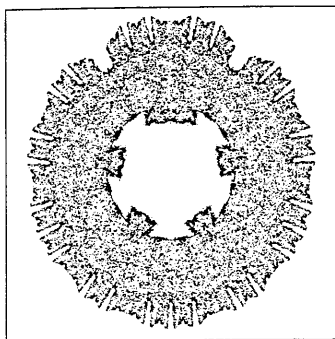
$a = 0.8037$



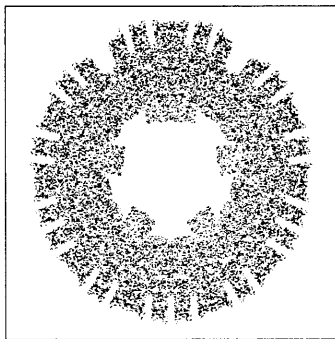
$a = 0.8036$



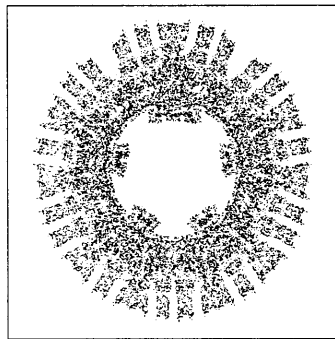
$a = 0.8041$



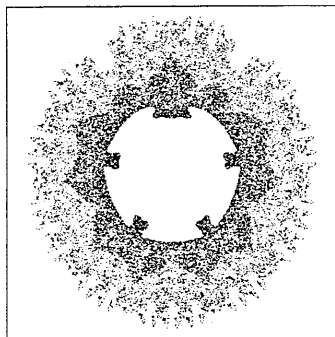
$a = 0.8040$



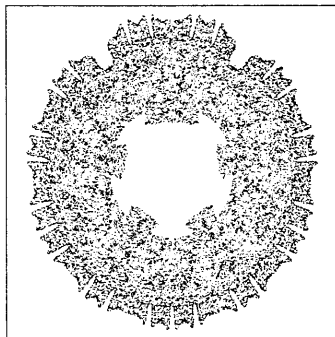
$a = 0.8039$



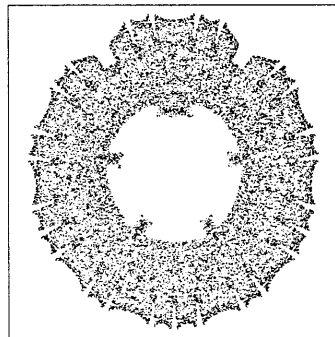
$a = 0.8044$



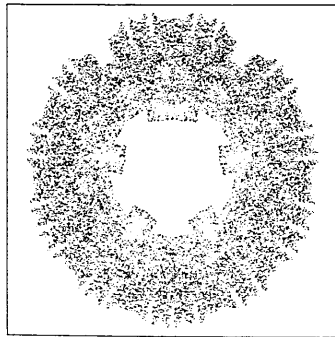
$a = 0.8043$



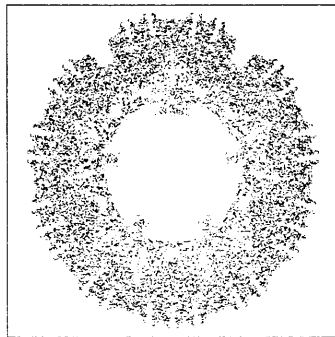
$a = 0.8042$



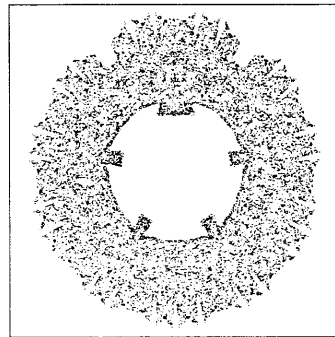
$a = 0.8047$



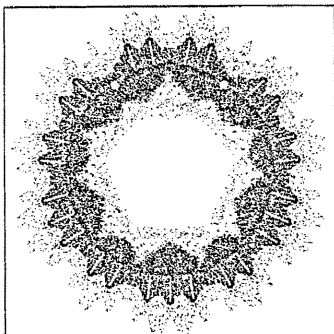
$a = 0.8046$



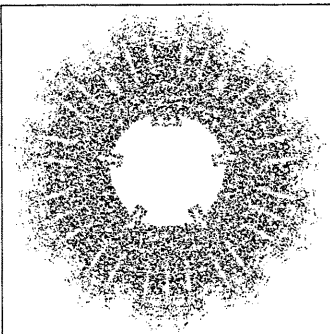
$a = 0.8045$



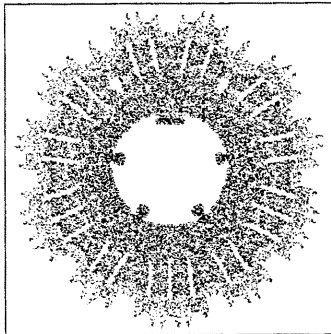
$a = 0.8026$



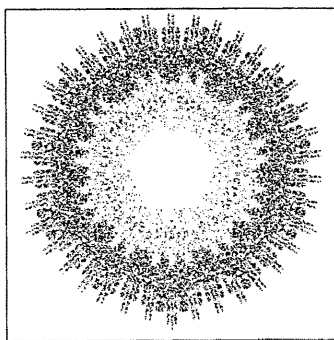
$a = 0.8025$



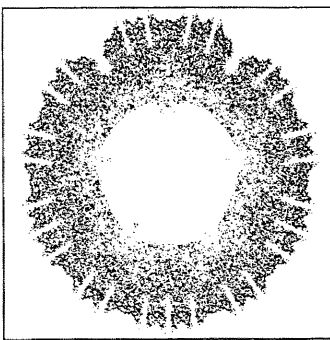
$a = 0.8024$



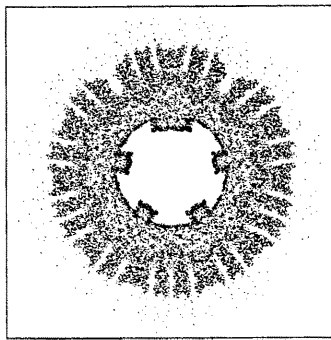
$a = 0.8029$



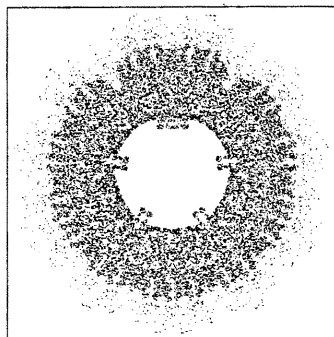
$a = 0.8028$



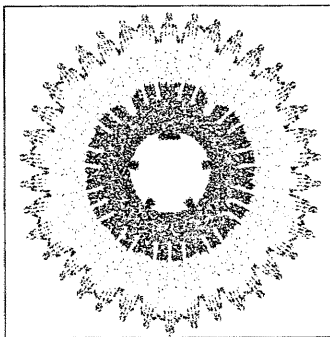
$a = 0.8027$



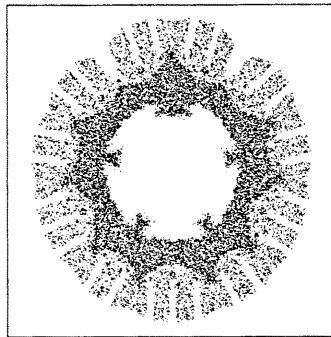
$a = 0.8032$



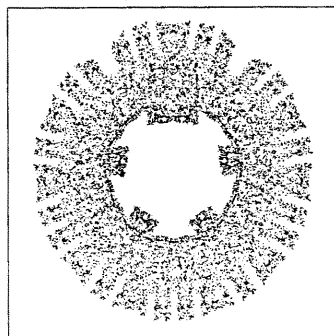
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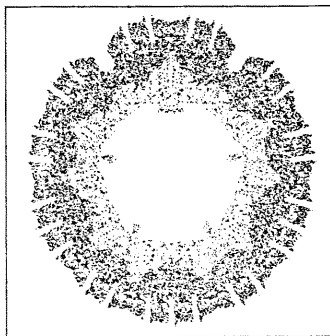
$a = 0.8030$



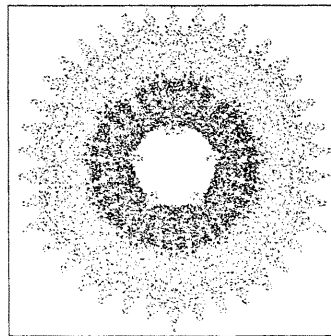
$a = 0.8035$



$a = 0.8034$

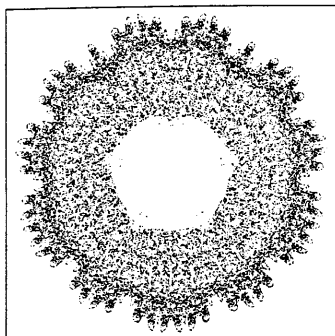


$a = 0.8033$

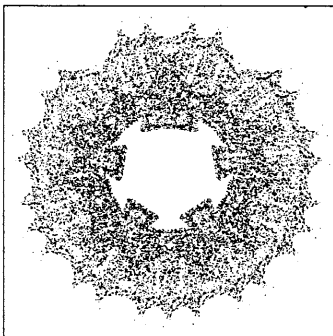


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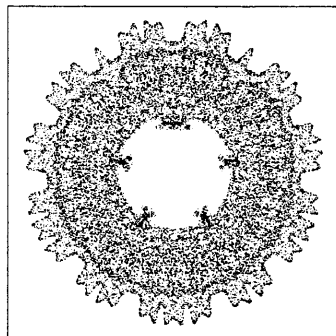
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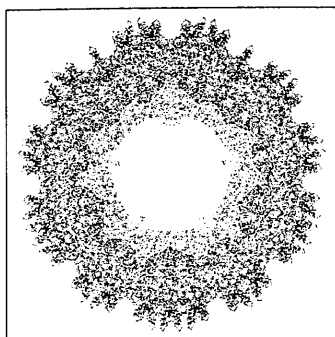
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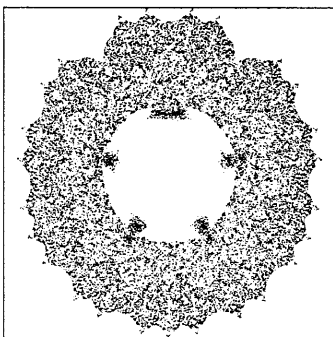
$a = 0.8012$



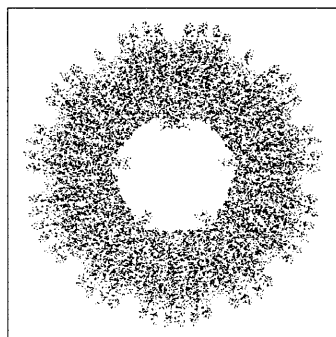
$a = 0.8017$



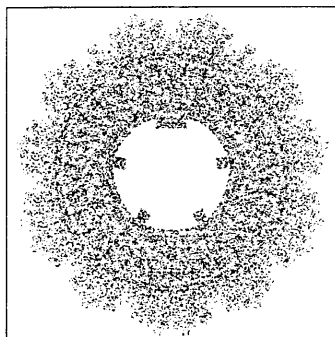
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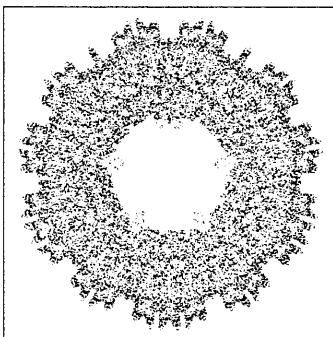
$a = 0.8015$



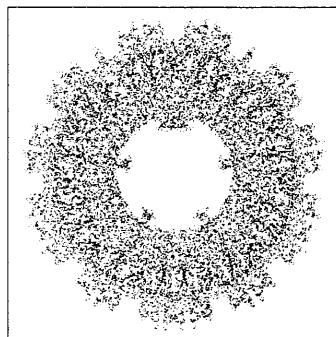
$a = 0.8020$



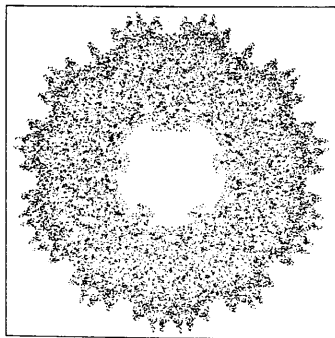
$a = 0.8019$



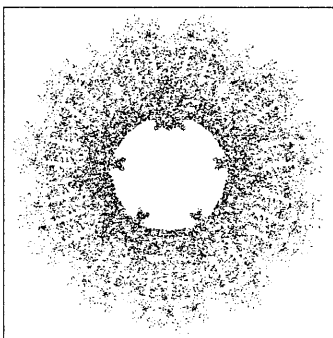
$a = 0.8018$



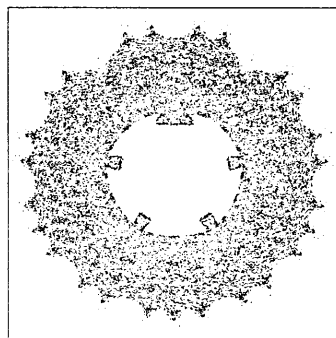
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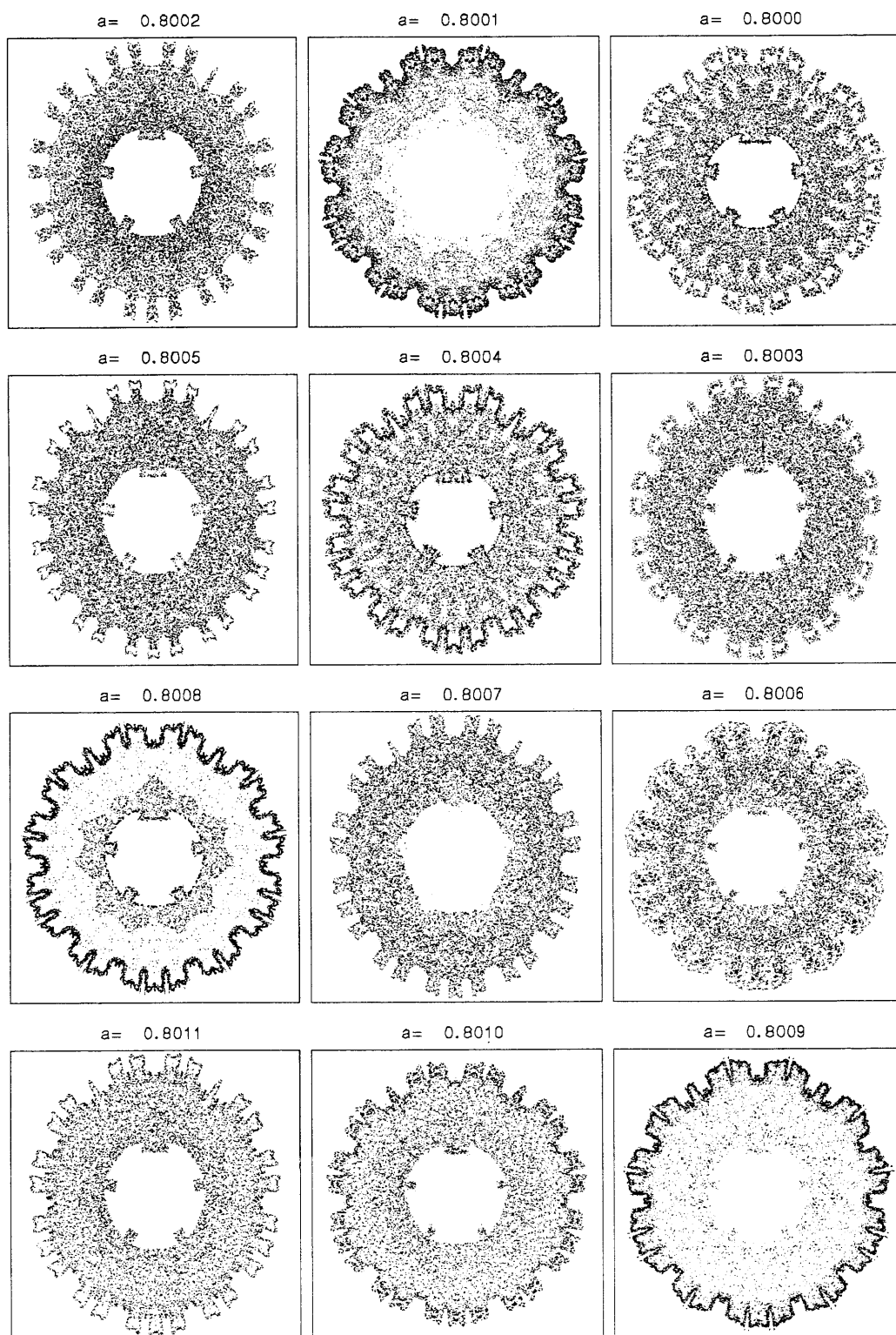


$a = 0.8022$



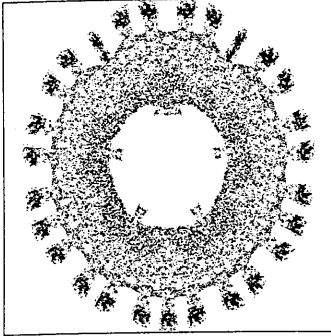
$a = 0.8021$



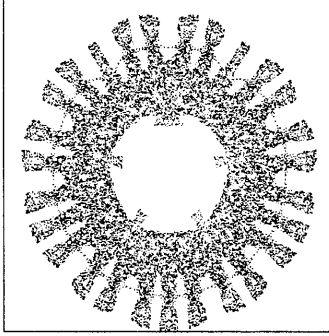


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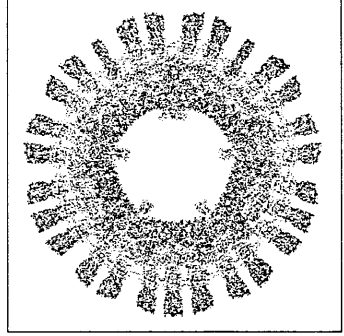
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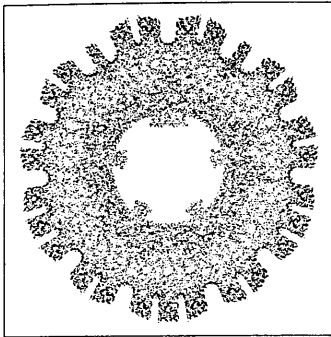
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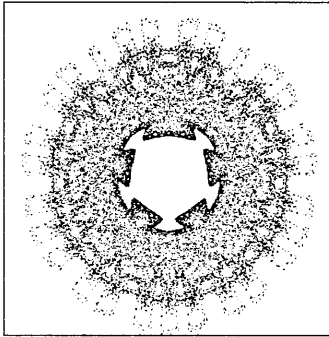
$a = 0.7988$



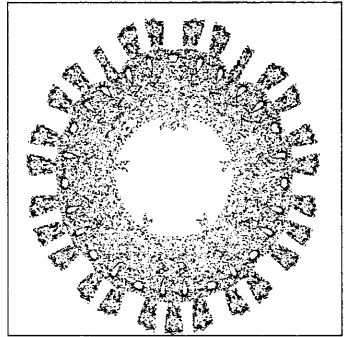
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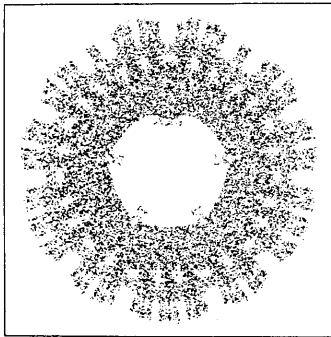
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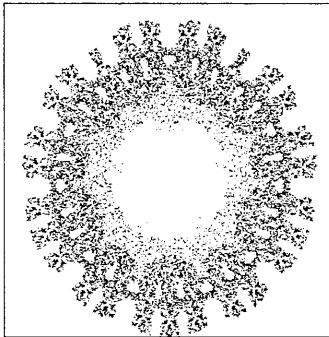
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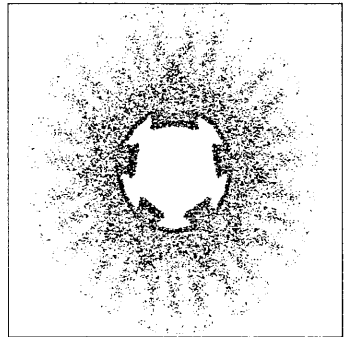
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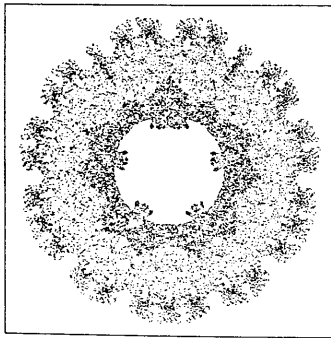
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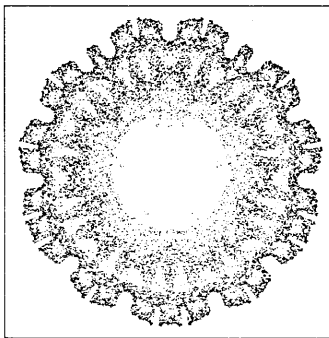
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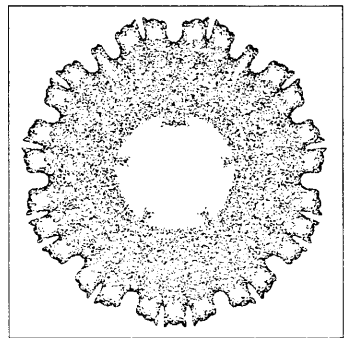
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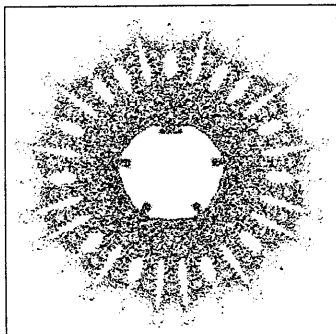
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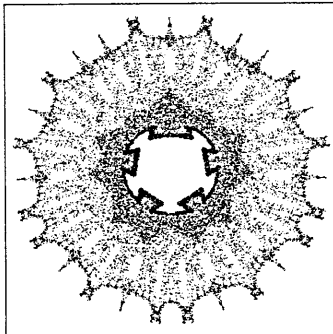
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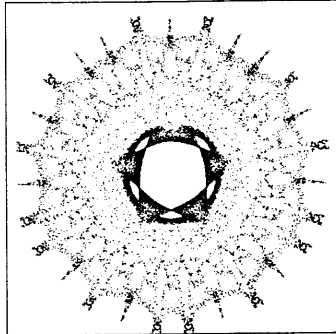
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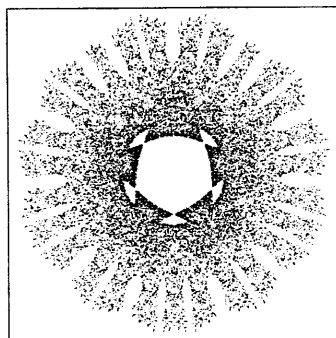
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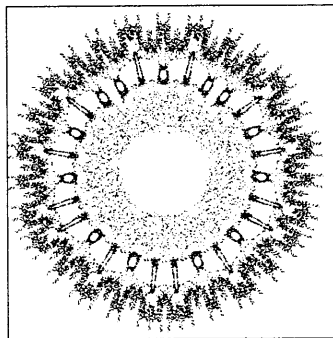
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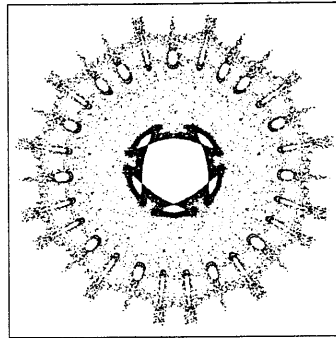
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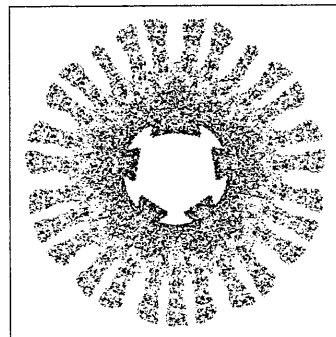
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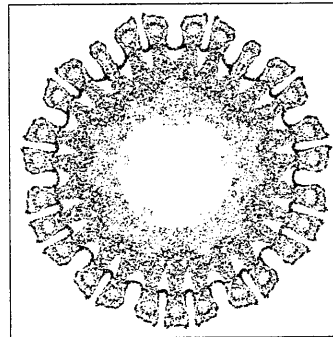
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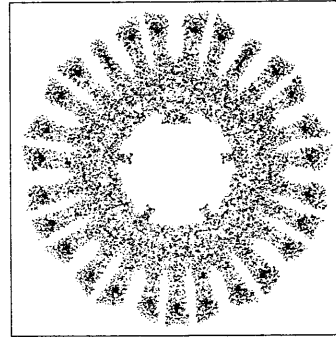
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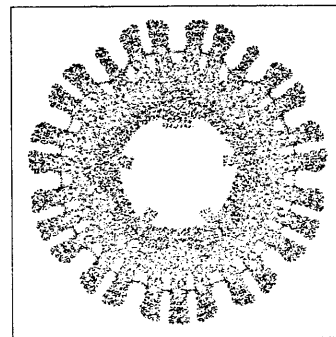
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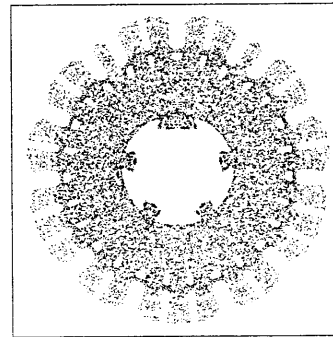
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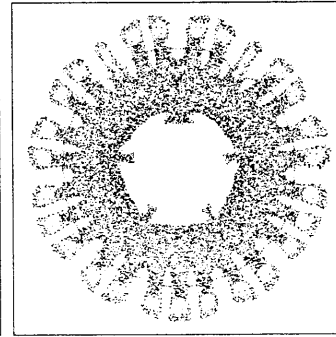
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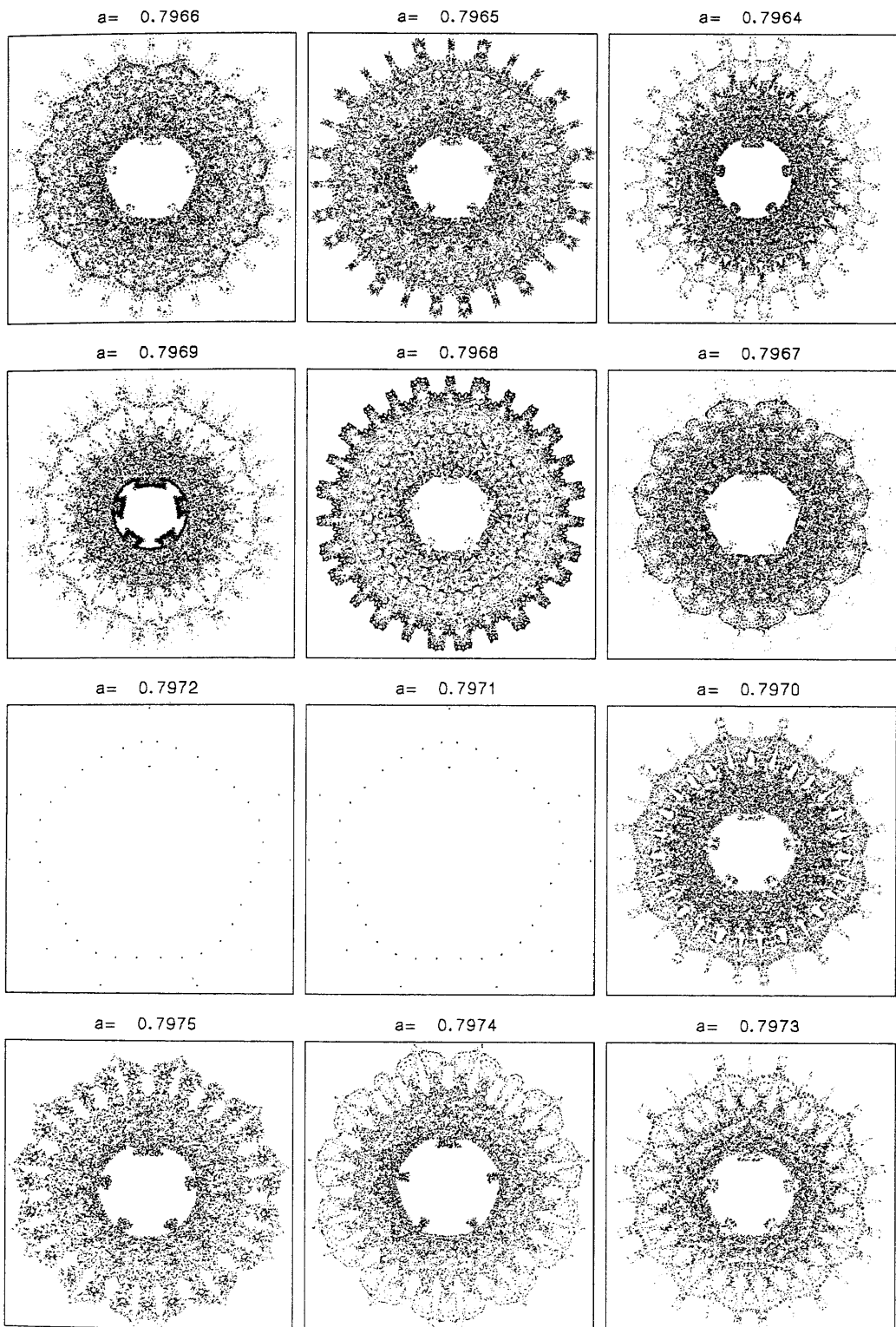
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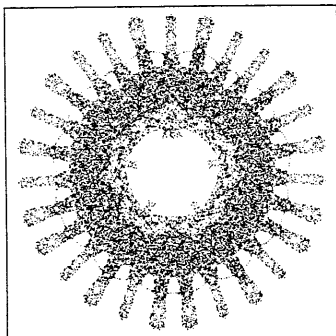
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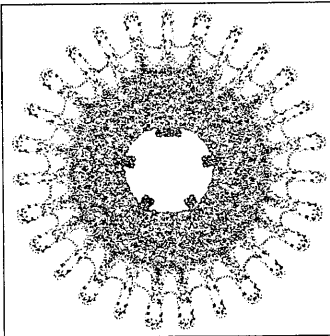
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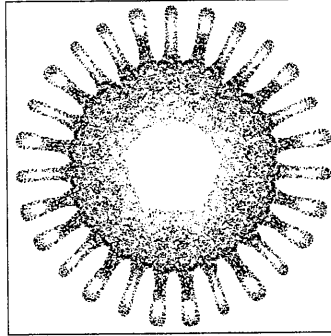
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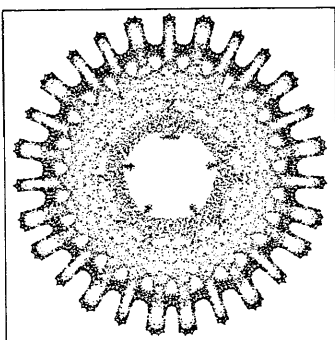
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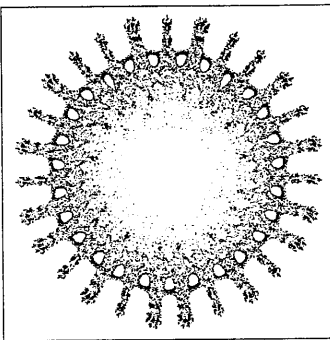
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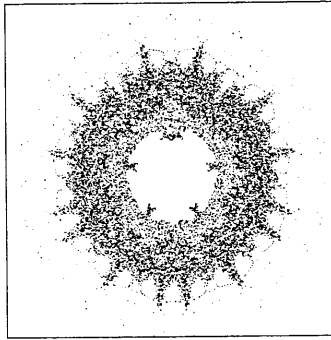
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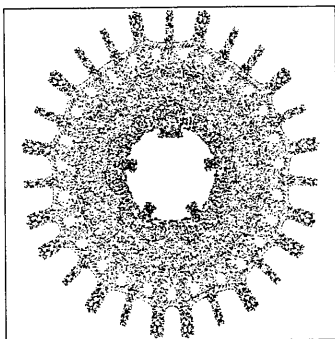
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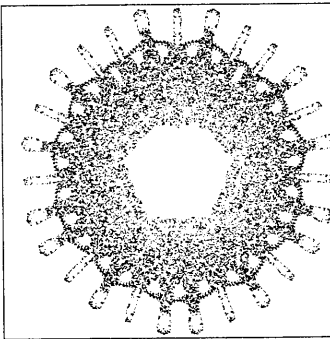
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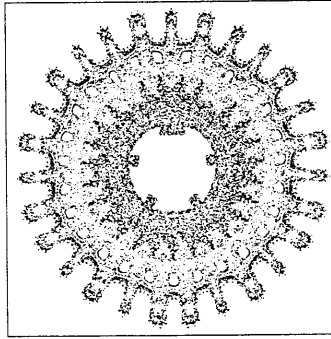
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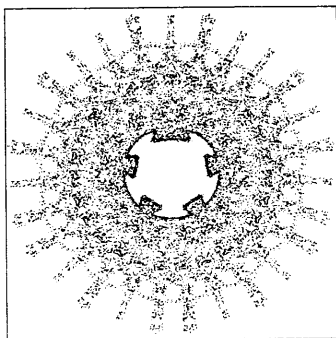
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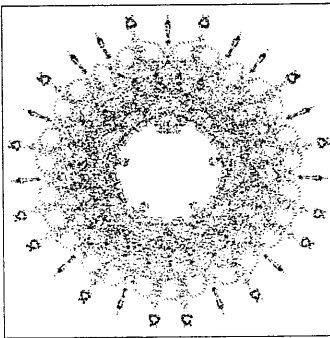
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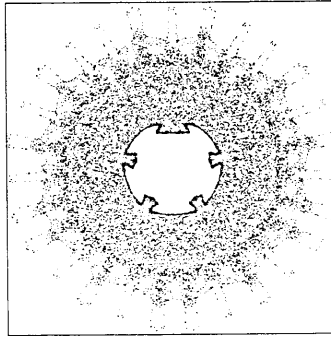
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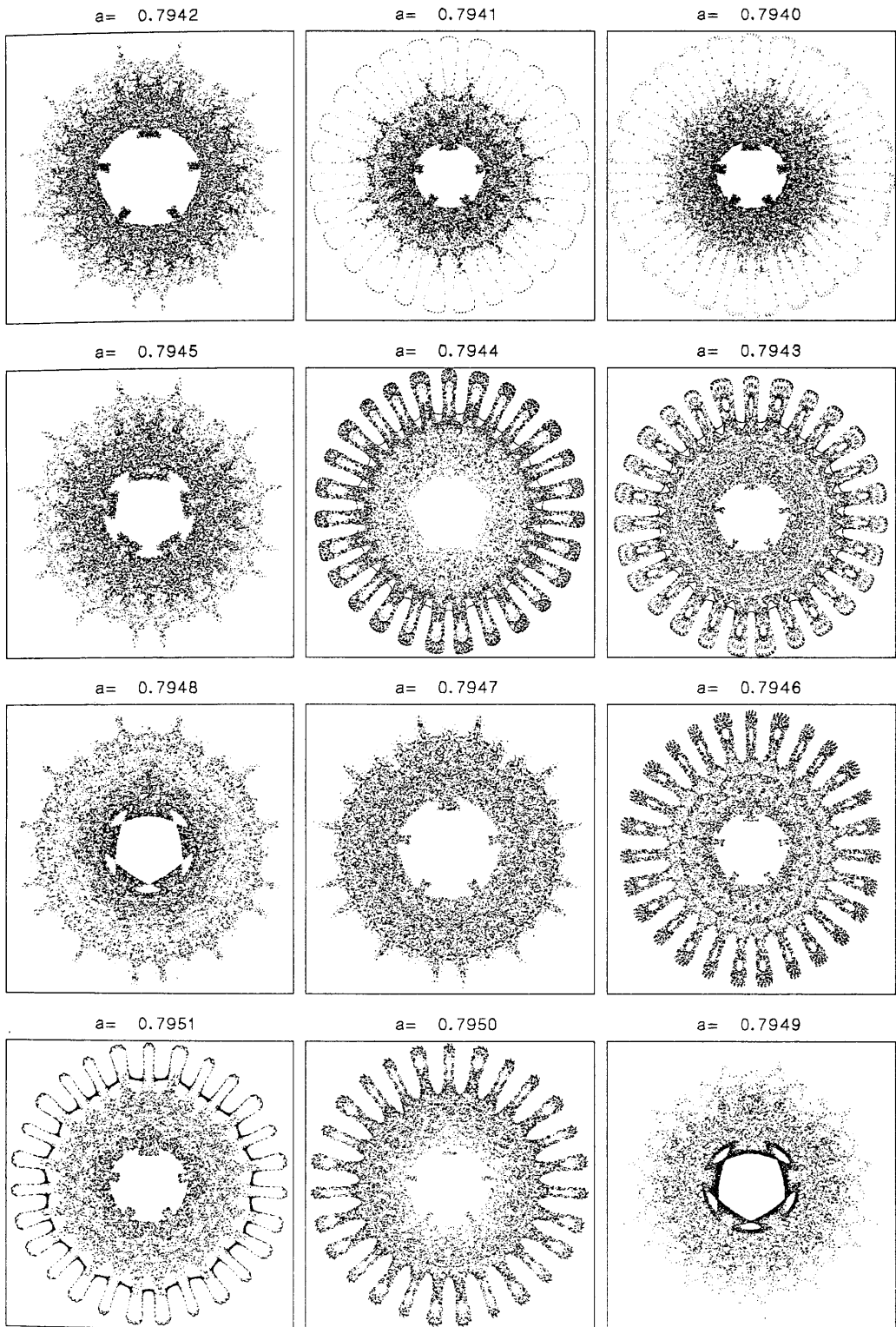


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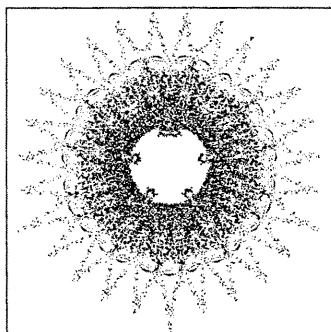


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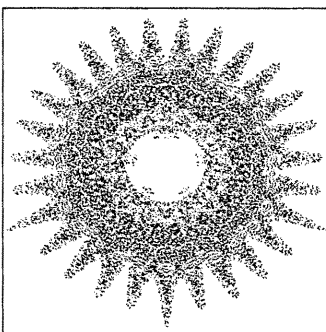




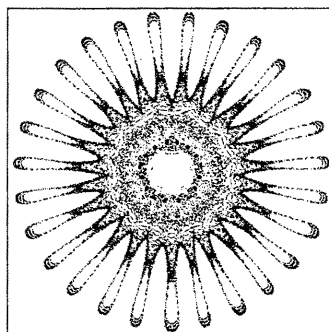
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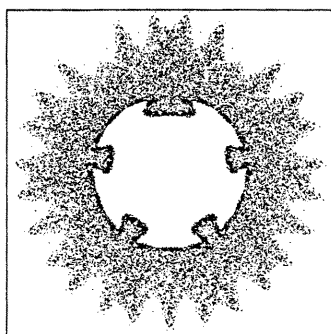
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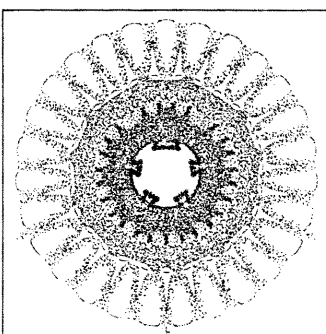
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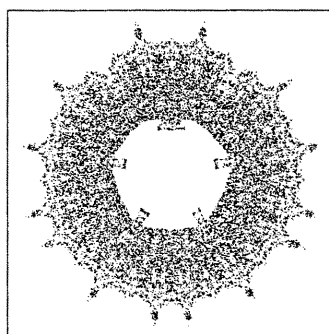
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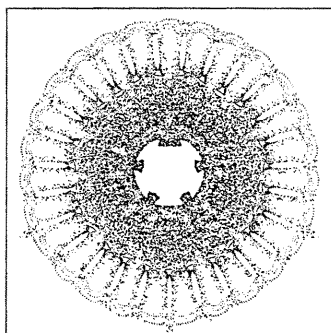
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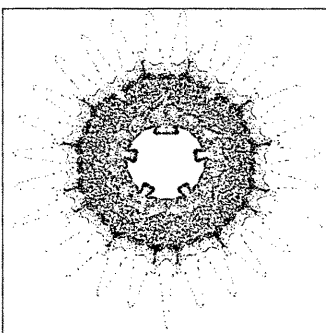
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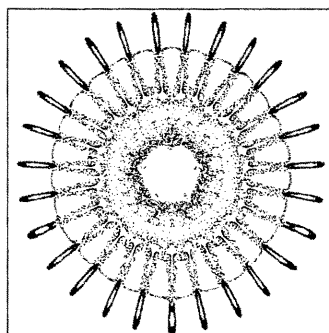
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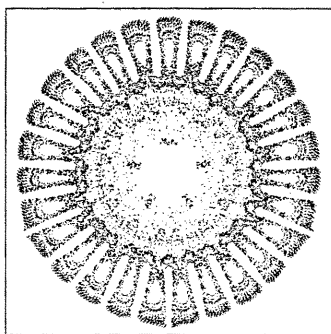
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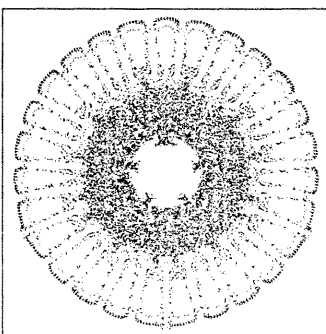
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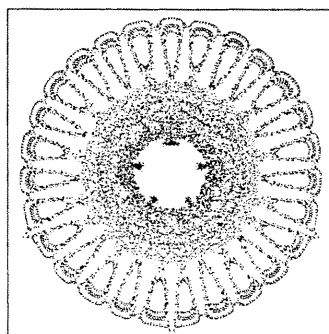
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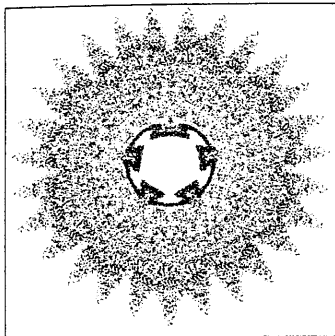
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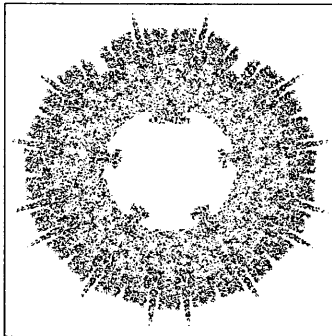
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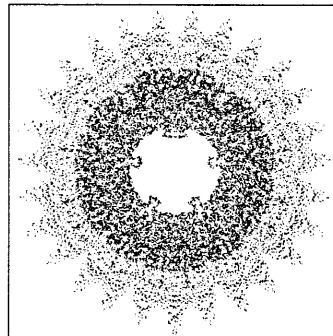
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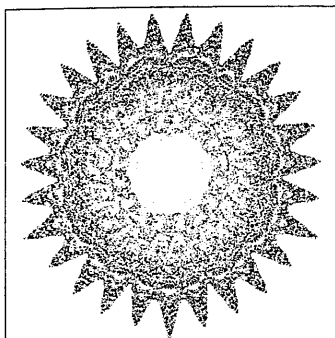
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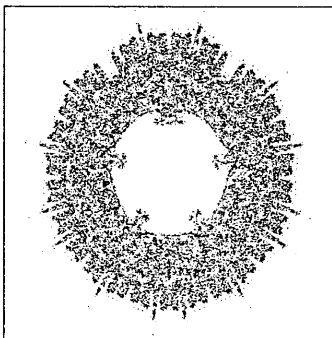
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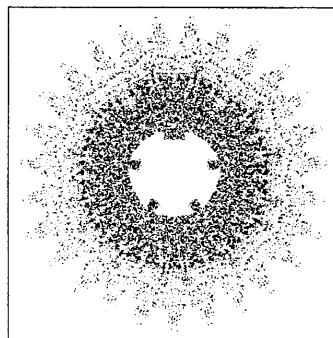
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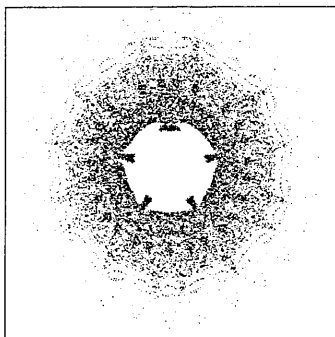
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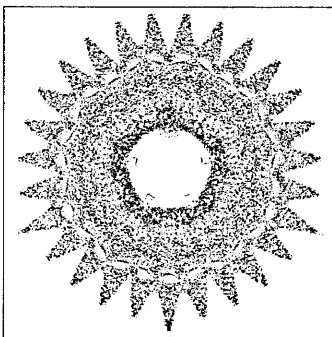
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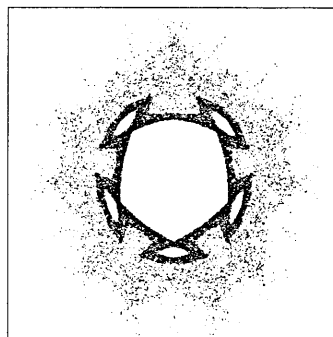
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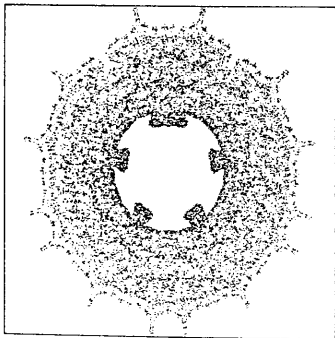
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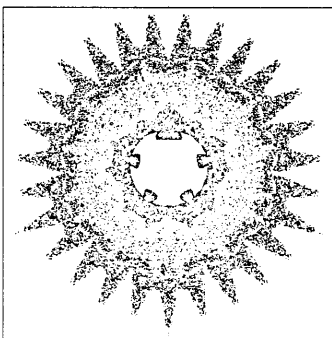
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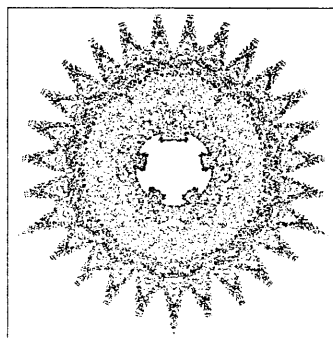
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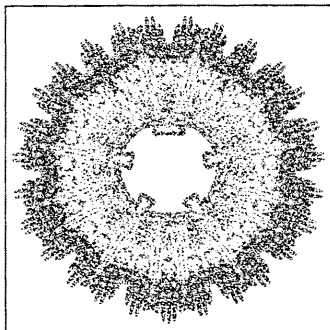
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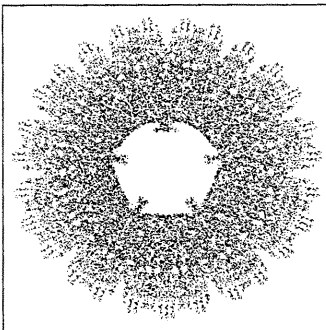
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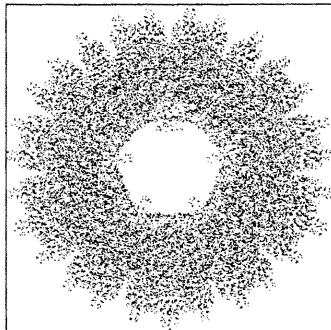
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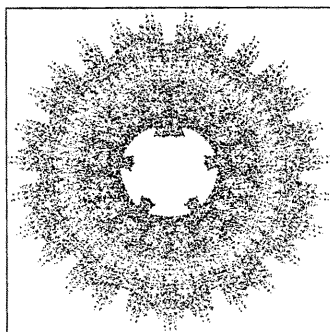
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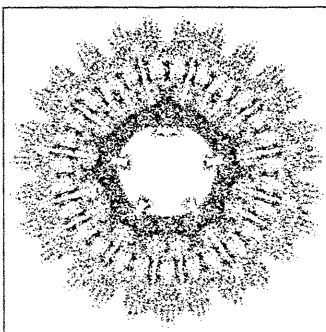
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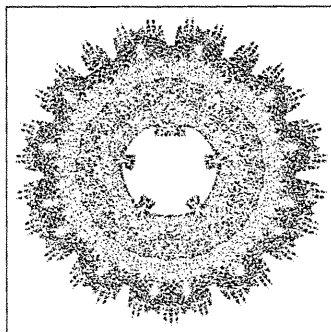
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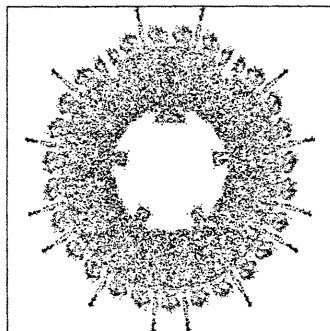
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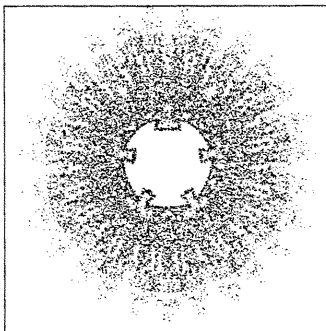
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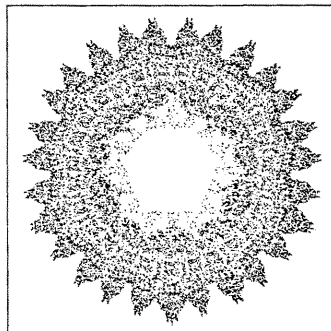
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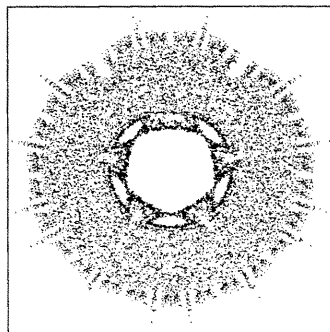
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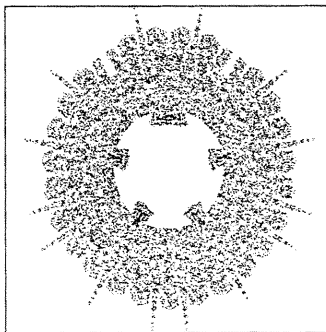
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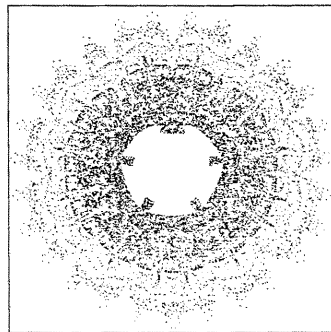
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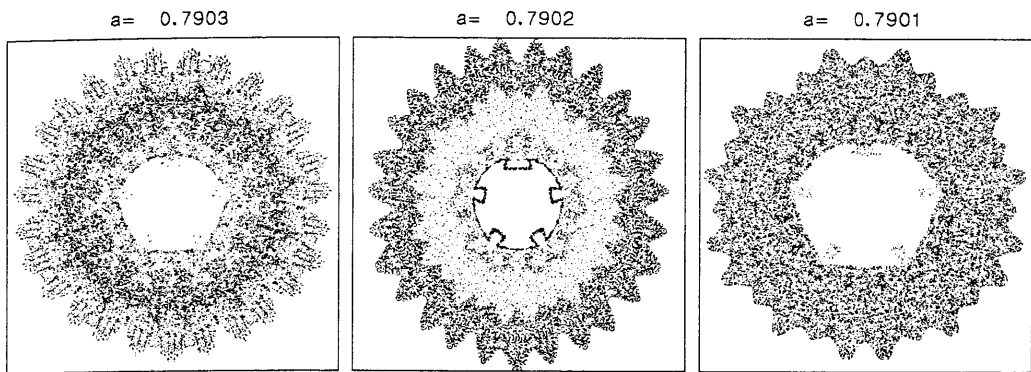
$a = 0.7914$



$a = 0.7913$



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Literatur

- 1) S. Yajima: Aufbau der Bilder Batabase des Chaos, Memoir Of The Kokushikan University Center for Information Science Nr. 15, S.19-55, 1994.
- 2) S. Yajima: Aufbau der Bilder Batabase des Chaos II. Teil, Memoir Of The Kokushikan University Center For Information Science Nr. 16, S.48-119, 1995.
- 3) S. Yajima: Aufbau der Bilder Batabase des Chaos III. Teil, Memoir Of The Kokushikan University Center For Information Science Nr. 17, S.85-94, 1996.
- 4) FACOM JEF Buchstaben Code Index Handbuch Fujitsu 1987, S.619, S.626.