Change From:

11 Dimension of equidistribution

We calculated $d(v)$s for our generators, by using method described in § 8.

Table 6 lists the dimension defects $d(v)$ of dSFMT, for Mersenne exponent (mexp) $= 521, 1279, 2203, 4253, 11213, 19937$ and $v = 1, 2, \ldots, 52$. The $d(v)$ for $1 \leq v \leq 22$ are very small. The larger mexp seems to lead to the larger $d(v)$ for $v > 22$. Still, the case mexp=19937 has total dimension defect $\Delta = 2608$, which is smaller than 4188 of SFMT19937's 32-bit Δ and 6750 of MT19937's 32-bit Δ (note that Δ tends to increase according to the increase of the bit size of the generated numbers, by its definition).

Table 6: $d(v)$ $(1 \leq v \leq 52)$ of 52-bit fraction part of dSFMTv2.

	521	1279	2203	4253	11213	19937		521	1279	2203	4253	11213	19937
d(1)	0	1	0	0	4	0	d(27)	0	0	1	1	33	4
d(2)	0	1	1	0	0	1	d(28)	0	6	7	28	33	10
d(3)	0	2	1	0	0	1	d(29)	1	5	7	23	28	67
d(4)	0	0	0	0	1	1	d(30)	3	3	15	18	80	126
d(5)	0	0	0	0	0	0	d(31)	2	6	13	15	68	107
d(6)	0	1	1	0	1	0	d(32)	4	4	10	10	58	88
d(7)	0	0	0	0	0	1	d(33)	6	12	25	43	120	220
d(8)	0	0	0	0	0	1	d(34)	6	12	23	44	114	202
d(9)	0	1	0	0	0	0	d(35)	5	11	21	40	105	185
d(10)	1	0	0	0	0	0	d(36)	5	10	20	37	96	169
d(11)	0	0	0	0	0	0	d(37)	5	9	18	33	88	155
d(12)	0	0	0	0	0	0	d(38)	4	8	16	30	80	141
d(13)	0	0	0	0	0	0	d(39)	4	7	15	28	72	128
d(14)	0	0	0	0	0	1	d(40)	4	6	14	25	65	115
d(15)	0	0	0	0	0	1	d(41)	3	6	12	22	58	103
d(16)	0	0	0	0	0	1	d(42)	3	5	11	20	51	91
d(17)	0	0	0	0	0	0	d(43)	3	4	10	17	45	80
d(18)	0	0	0	0	0	0	d(44)	2	4	9	15	39	70
d(19)	0	0	0	0	0	0	d(45)	2	3	7	13	34	60
d(20)	1	0	0	0	0	0	d(46)	2	2	6	11	28	50
d(21)	0	0	0	0	7	0	d(47)	2	2	5	9	23	41
d(22)	0	0	0	0	0	134	d(48)	1	1	4	7	18	32
d(23)	0	0	7	16	22	94	d(49)	1	1	3	5	13	23
d(24)	0	1	3	9	19	58	d(50)	1	0	3	4	9	15
d(25)	0	1	0	6	7	25	d(51)	1	0	2	2	4	7
d(26)	0	0	0	0	0	0	d(52)	1	0	1	0	0	0
total dimension defect Δ								73	135	291	531	1423	2608

Change To:

11 Dimension of equidistribution

We calculated $d(v)$s for our generators, by using method described in § 8.

Table 6 lists the dimension defects $d(v)$ of dSFMT, for Mersenne exponent (mexp) $= 521, 1279, 2203, 4253, 11213, 19937$ and $v = 1, 2, \ldots, 52$. The $d(v)$ for $1 \le v \le 22$ are very small. The larger mexp seems to lead to the larger $d(v)$ for $v > 22$. Still, the case mexp=19937 has total dimension defect $\Delta =$ **2616**, which is smaller than **4199** of SFMT19937's 32-bit Δ and 6750 of MT19937's 32-bit Δ (note that Δ tends to increase according to the increase of the bit size of the generated numbers, by its definition).

Table 6: $d(v)$ $(1 \le v \le 52)$ of 52-bit fraction part of dSFMTv2.

	521	1279	2203	4253	11213	19937		521	1279	2203	4253	11213	19937
d(1)	**1**	1	**1**	**1**	4	**1**	d(27)	**1**	**1**	1	1	33	4
d(2)	0	1	1	0	0	2	d(28)	0	**7**	**8**	28	33	10
d(3)	**1**	**1**	1	**1**	**1**	1	d(29)	1	**6**	**6**	23	**27**	67
d(4)	0	**1**	0	**1**	1	**2**	d(30)	**2**	**4**	15	18	80	126
d(5)	0	**1**	0	0	0	1	d(31)	2	6	13	15	68	**106**
d(6)	0	1	1	0	1	0	d(32)	4	4	10	10	58	88
d(7)	0	0	0	**1**	**1**	1	d(33)	6	**11**	25	43	120	**219**
d(8)	**1**	**1**	**1**	**1**	**1**	**2**	d(34)	6	12	23	44	114	**201**
d(9)	**1**	**2**	0	0	**1**	**1**	d(35)	5	11	21	40	105	**184**
d(10)	1	**1**	0	**1**	**1**	**1**	d(36)	5	10	20	37	96	**168**
d(11)	**1**	0	0	0	**1**	0	d(37)	5	9	18	33	88	155
d(12)	**1**	0	**1**	0	0	**1**	d(38)	4	8	16	30	80	141
d(13)	0	0	**1**	**1**	0	**1**	d(39)	4	7	15	28	72	128
d(14)	**1**	**1**	**1**	**1**	0	1	d(40)	4	6	14	25	65	115
d(15)	0	**1**	0	**1**	**1**	1	d(41)	3	6	12	22	58	103
d(16)	0	**1**	**1**	**1**	0	1	d(42)	3	5	11	20	51	91
d(17)	0	**1**	**1**	0	**1**	0	d(43)	3	4	10	17	45	80
d(18)	0	**1**	0	0	0	**1**	d(44)	2	4	9	15	39	70
d(19)	**1**	**1**	**1**	**1**	0	**1**	d(45)	2	3	7	13	34	60
d(20)	1	**1**	0	0	0	0	d(46)	2	2	6	11	28	50
d(21)	0	0	0	0	7	**1**	d(47)	2	2	5	9	23	41
d(22)	**1**	0	0	**1**	**1**	134	d(48)	1	1	4	7	18	32
d(23)	0	**1**	7	16	22	94	d(49)	1	1	3	5	13	23
d(24)	**1**	1	3	9	19	58	d(50)	1	**1**	3	4	9	15
d(25)	0	1	0	6	7	25	d(51)	1	**1**	2	2	4	7
d(26)	0	**1**	0	**1**	**1**	0	d(52)	1	0	1	**1**	**1**	**1**
total dimension defect Δ								**83**	**153**	**299**	**545**	**1433**	**2616**