Minimum distance of BCH codes of length 511

Anne Canteaut and Florent Chabaud

n	k	δ	d		argument
511	502	3	3		RM(7)
	493	5	5		RM(7)
	484	7	7		RM(6)
	475	9	9		ES
	466	11	11		RM(6)
	457	13	13		S
	448	15	15		RM(15)
	439	17	17		ES
	430	19	19		ID
	421	21	21		PS(73,3)
	412	23	23		RM(5)
	403	25	25		S
	394	27	27		RM(5)
	385	29	29		**
	376	31	31		RM(4)
	367	35	35		PS(73,5)
	358	37	37		**
	349	39	39		ID
	340	41	41		**
	331	43	43		**
	322	45	45		ID
	313	47	47		RM(4)
	304	51	51		**
	295	53	53		NI
	286	55	55		RM(4)
	277	57	57		ID
	268	59	≥ 59		-
	259	61	≥ 61		-
	250	63	63		RM(3)
511	241	73	73		PS(7,1)
	238	75	≥ 75		-
	229	77	≥ 77		-
	220	79	79		ID
	211	83	83		ID
	202	85	≥ 85		-
	193	87	87		**
	184	91	91		ID
	175	93	95	#	4-DI
	166	95	95		RM(3)
	157	103	103		ID
	148	107	≥ 107		-
	139	109	111	#	4-DI
	130	111	111		RM(3)
	121	117	119	#	4-DI
	112	119	119		RM(3)
	103	123	127	##	NI
	94	125	127	#	4-DI
	85	127	127		RM(2)
	76	171	171		ES
	67	175	175		ES
	58	183	183		ES
	49	187	187		ES
	40	191	191		RM(2)
	31	219	219		PS(7,3)
	28	223	223		RM(2)
	19	239	239		RM(2)
	10	255	255		RM(1)

#	$d = \delta + 2$
##	$d = \delta + 4$

**	new result
ES	exhaustive search
ID	idempotent
NI	Newton's identities
RM(s)	intersection with the shortened sth-order Reed-Muller code
S	code shortening
PS(n_2, δ_2)	product subcode: $n = n_1 n_2$ and $\delta = n_1 \delta_2$ where BCH(n_2, δ_2) has minimum distance equal to δ_2
4-DI	4-divisibility of RM(4)