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**Submission Title:** More description about CSK constellation

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**Abstract:** CSK constellation all color band combinations

**Purpose:** Contribution to IEEE 802.15.7 TG-VLC

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# **CSK constellation all color band combinations**

2010.09.13

Samsung Yokohama Research Institute

Atsuya Yokoi

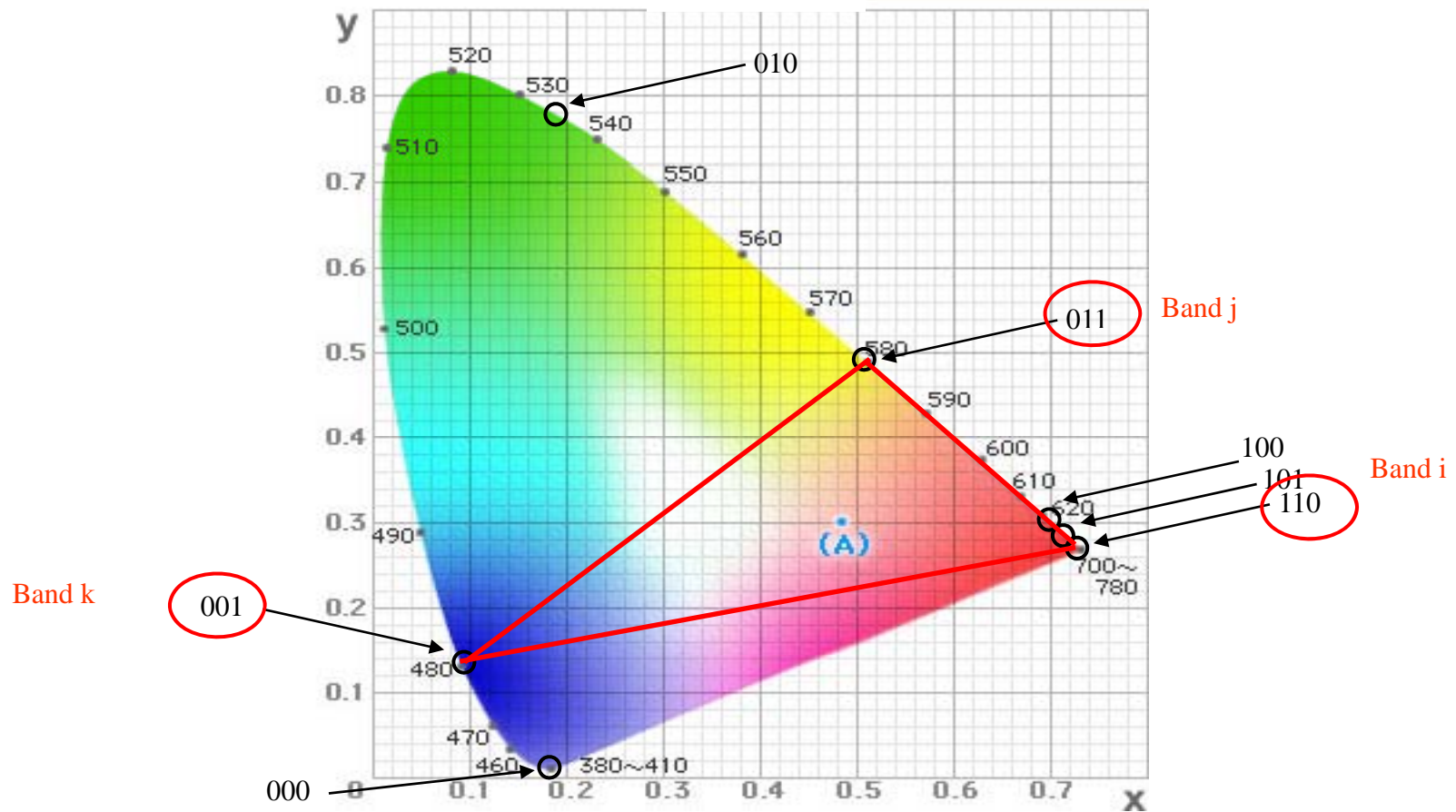
## ***xy* color coordinates values for each color band**

Color Code	color	Band (nm)	Center (nm)	(x , y)
000	pB	380-450	415	(0.18, 0.01)
001	B,BG	450-510	480	(0.09, 0.13)
010	G	510-560	535	(0.19, 0.78)
011	yG,gY	560-600	580	(0.51, 0.49)
100	rO	600-650	625	(0.70, 0.30)
101	R	650-710	680	(0.72, 0.28)
110	R	710-780	745	(0.73, 0.27)
111	Reserved	-	-	-

# Available Color band combinations

No.	Color codes for Color band combinations		
	Band i	Band j	Band k
1	110	011	001
2	110	011	000
3	110	010	001
4	110	010	000
5	101	011	001
6	101	011	000
7	101	010	001
8	101	010	000
9	100	011	001
10	100	011	000
11	100	010	001
12	100	010	000
13	011	010	001
14	011	010	000

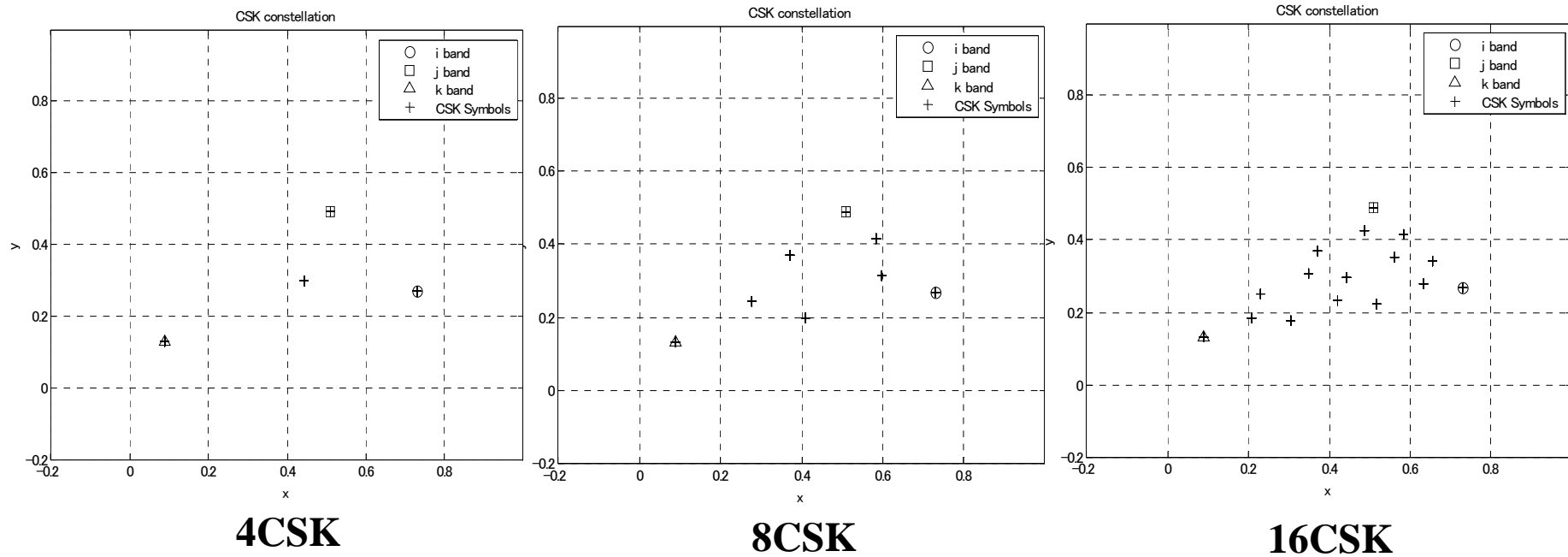
# Color band combination for CSK (110-011-001)



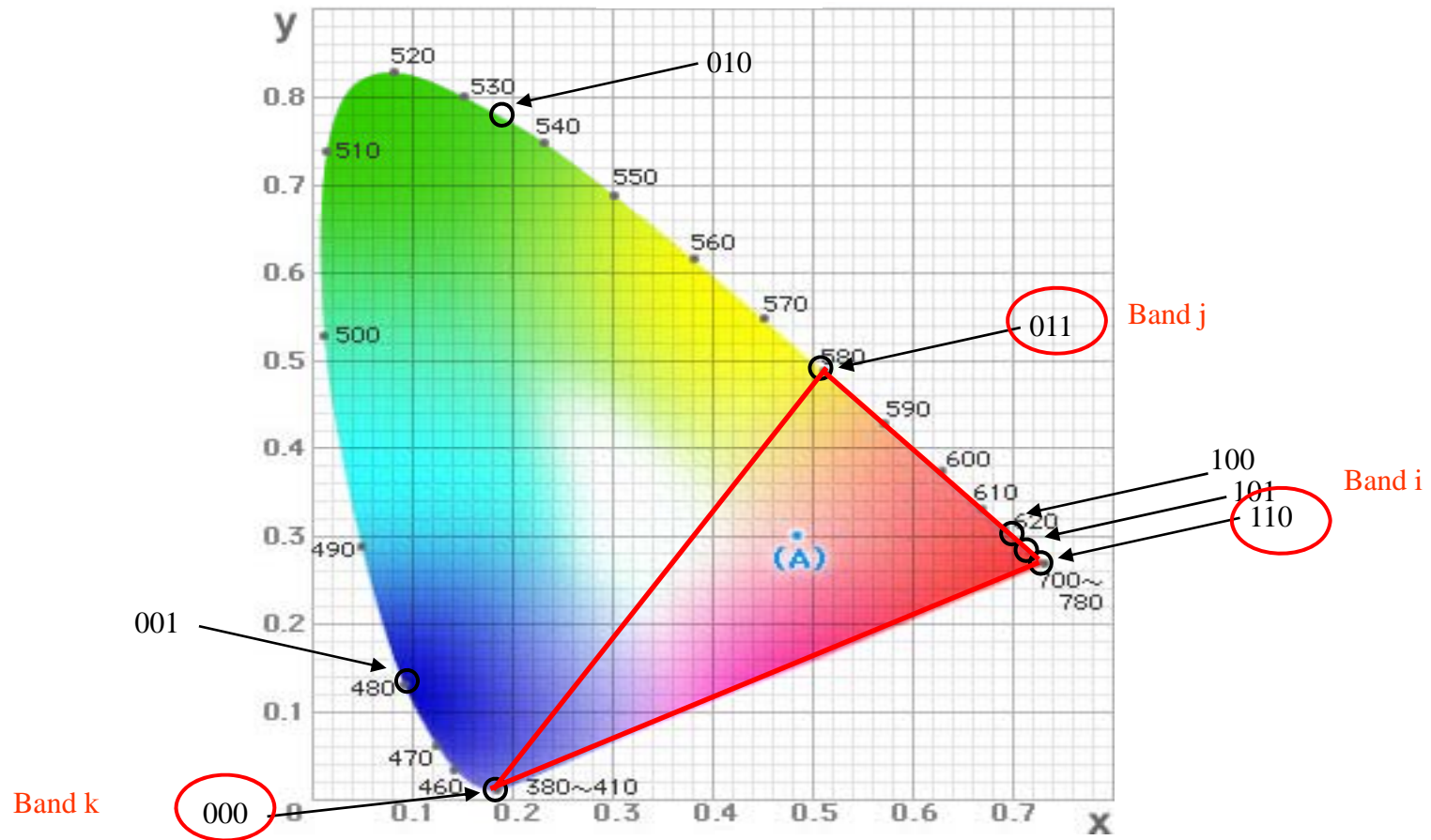
# CSK xy coordinates values (110-011-001)

Color band combination (No.1)		xy coordinates values of symbols		
Color codes	Center of band (x,y)	4CSK [data] – (xp,yp)	8CSK [data] – (xp,yp)	16CSK [data] – (xp,yp)
110	(0.730 0.270)	[0 0] --> (0.510 0.490)	[0 0 0] --> (0.510 0.490)	[0 0 0 0] --> (0.510 0.490)
011	(0.510 0.490)	[0 1] --> (0.443 0.297)	[0 0 1] --> (0.370 0.370)	[0 0 0 1] --> (0.488 0.426)
001	(0.090 0.130)	[1 0] --> (0.090 0.130)	[0 1 0] --> (0.583 0.417)	[0 0 1 0] --> (0.370 0.370)
		[1 1] --> (0.730 0.270)	[0 1 1] --> (0.598 0.316)	[0 0 1 1] --> (0.583 0.417)
			[1 0 0] --> (0.090 0.130)	[0 1 0 0] --> (0.348 0.306)
			[1 0 1] --> (0.278 0.246)	[0 1 0 1] --> (0.443 0.297)
			[1 1 0] --> (0.410 0.200)	[0 1 1 0] --> (0.561 0.352)
			[1 1 1] --> (0.730 0.270)	[0 1 1 1] --> (0.421 0.232)
				[1 0 0 0] --> (0.230 0.250)
				[1 0 0 1] --> (0.208 0.186)
				[1 0 1 0] --> (0.090 0.130)
				[1 0 1 1] --> (0.303 0.177)
				[1 1 0 0] --> (0.657 0.343)
				[1 1 0 1] --> (0.634 0.279)
				[1 1 1 0] --> (0.517 0.223)
				[1 1 1 1] --> (0.730 0.270)

# Constellations for (110-011-001)



# Color band combination for CSK (110-011-000)

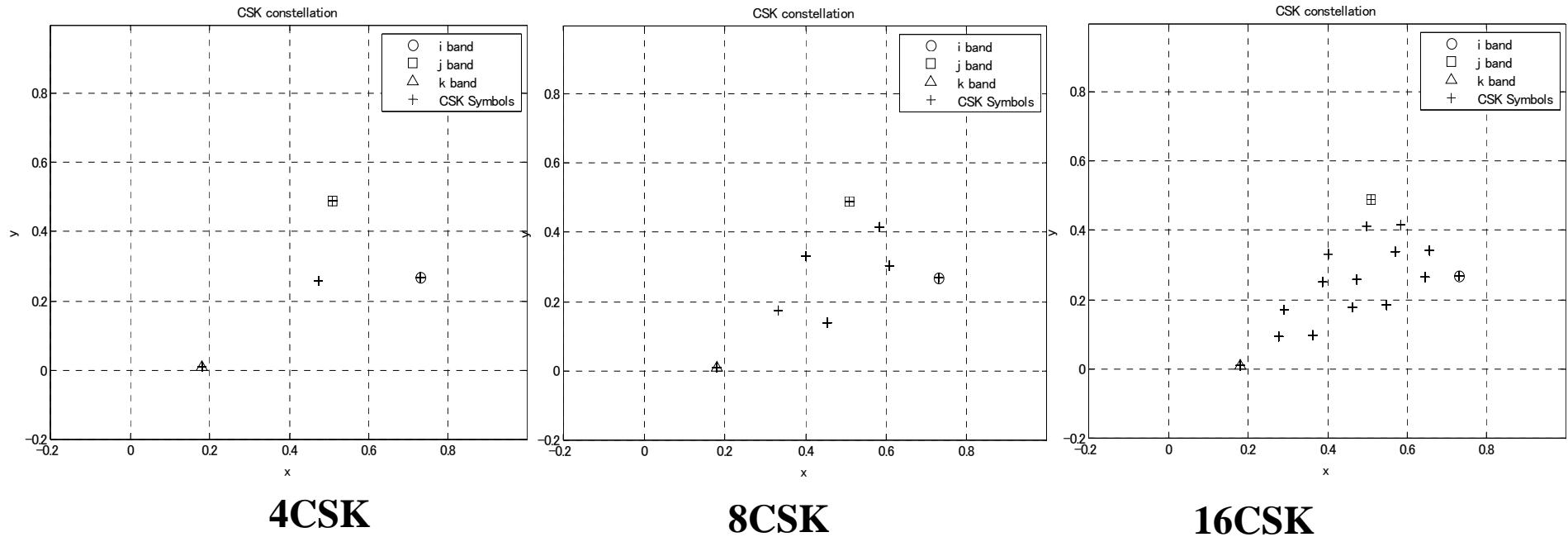




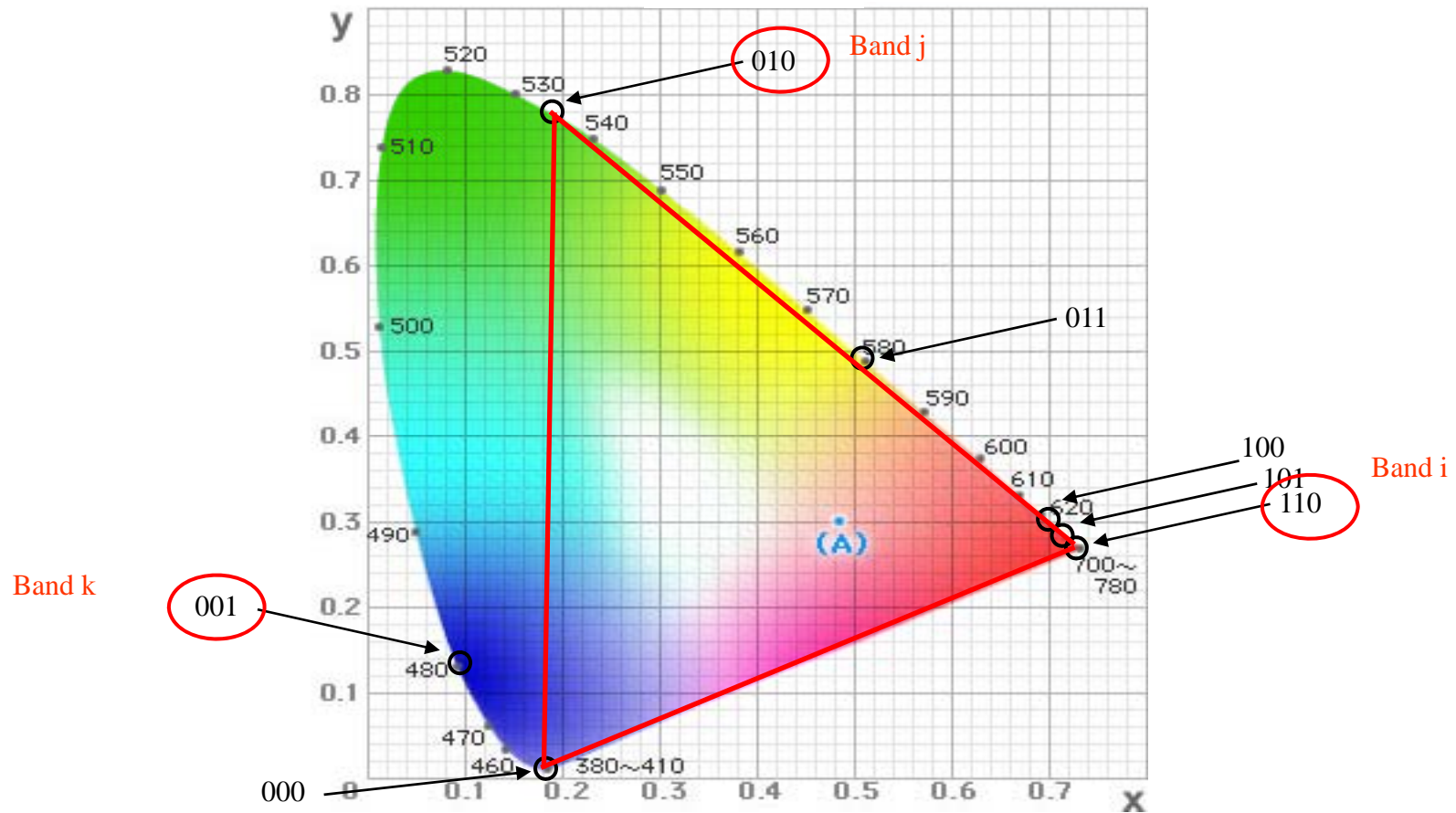
# CSK xy coordinates values (110-011-000)

Color band combination (No.2)		xy coordinates values of symbols		
Color codes	Center of band (x,y)	4CSK [data] – (xp,yp)	8CSK [data] – (xp,yp)	16CSK [data] – (xp,yp)
110	(0.730 0.270)	[0 0] --> (0.510 0.490)	[0 0 0] --> (0.510 0.490)	[0 0 0 0] --> (0.510 0.490)
011	(0.510 0.490)	[0 1] --> (0.473 0.257)	[0 0 1] --> (0.400 0.330)	[0 0 0 1] --> (0.498 0.412)
000	(0.180 0.010)	[1 0] --> (0.180 0.010)	[0 1 0] --> (0.583 0.417)	[0 0 1 0] --> (0.400 0.330)
		[1 1] --> (0.730 0.270)	[0 1 1] --> (0.608 0.302)	[0 0 1 1] --> (0.583 0.417)
			[1 0 0] --> (0.180 0.010)	[0 1 0 0] --> (0.388 0.252)
			[1 0 1] --> (0.333 0.172)	[0 1 0 1] --> (0.473 0.257)
			[1 1 0] --> (0.455 0.140)	[0 1 1 0] --> (0.571 0.339)
			[1 1 1] --> (0.730 0.270)	[0 1 1 1] --> (0.461 0.179)
				[1 0 0 0] --> (0.290 0.170)
				[1 0 0 1] --> (0.278 0.092)
				[1 0 1 0] --> (0.180 0.010)
				[1 0 1 1] --> (0.363 0.097)
				[1 1 0 0] --> (0.657 0.343)
				[1 1 0 1] --> (0.644 0.266)
				[1 1 1 0] --> (0.547 0.183)
				[1 1 1 1] --> (0.730 0.270)

# Constellations for (110-011-000)



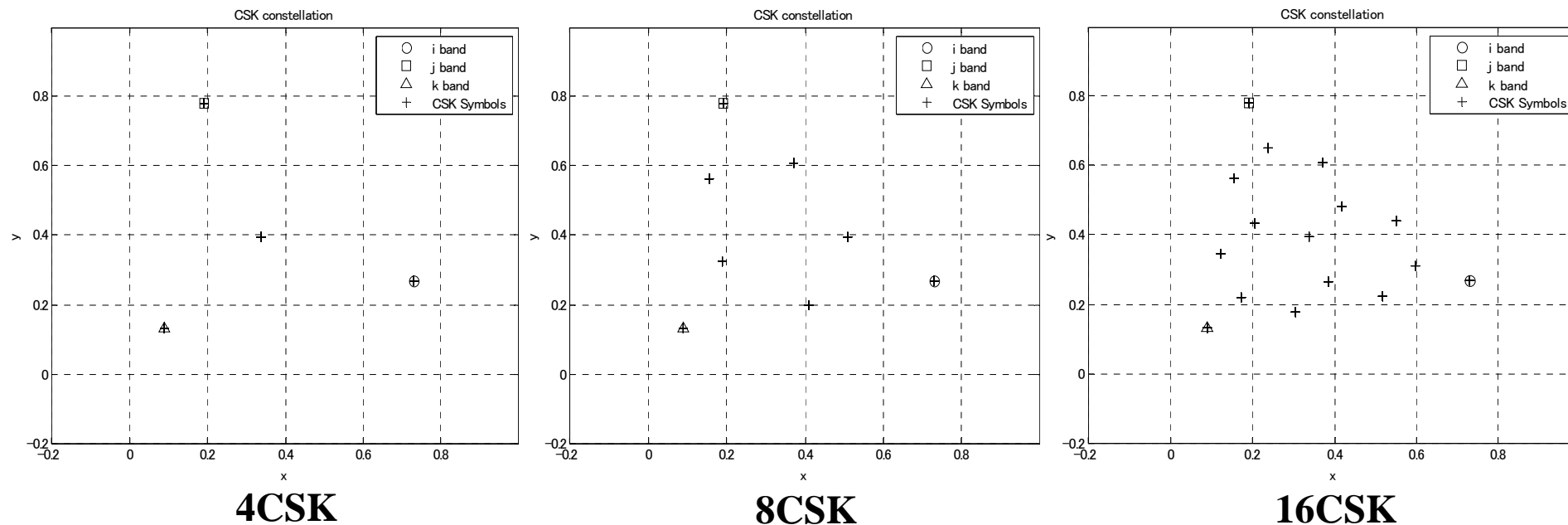
# Color band combination for CSK (110-010-001)



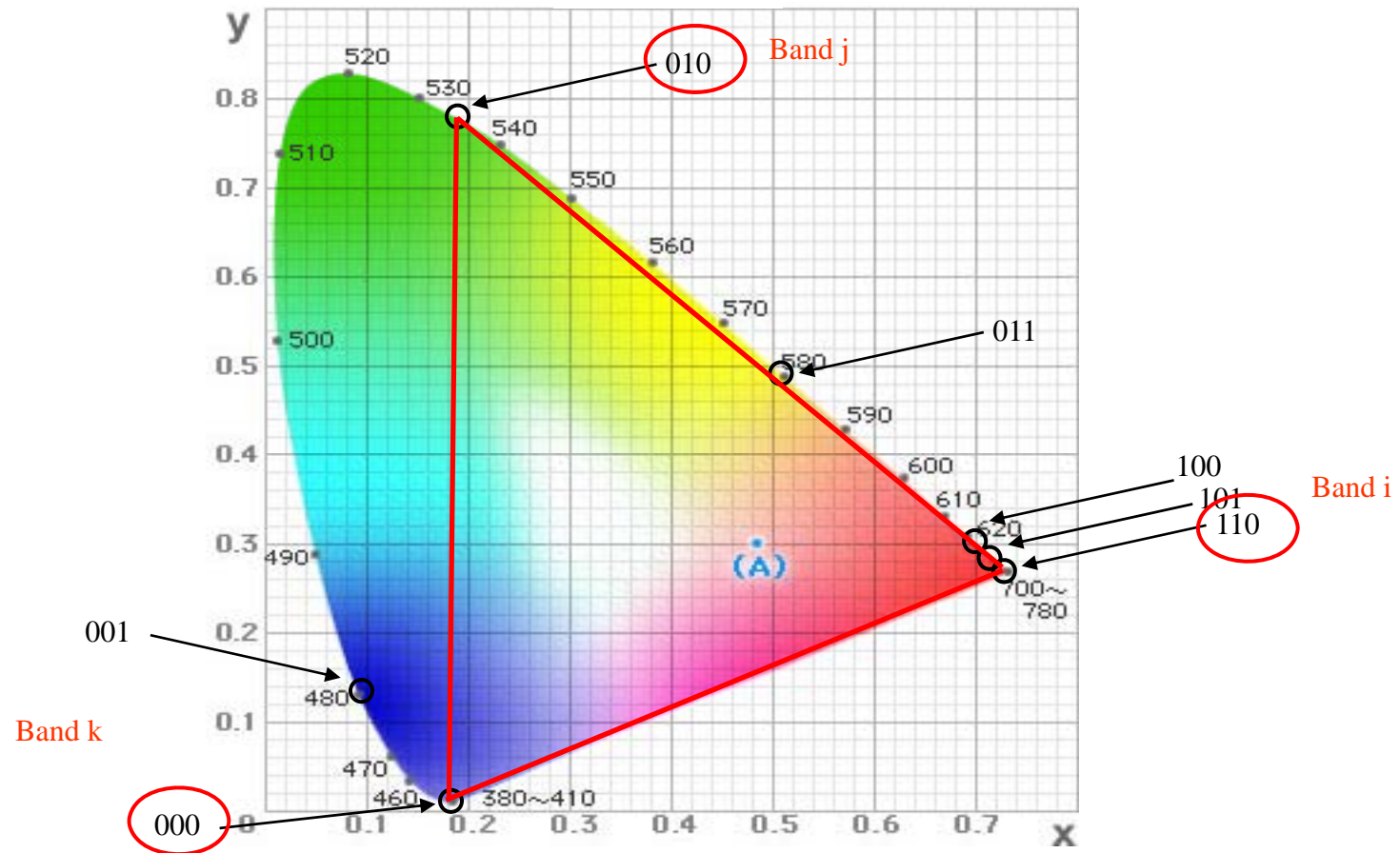
# CSK xy coordinates values (110-010-001)

Color band combination (No.3)		xy coordinates values of symbols		
Color codes	Center of band (x,y)	4CSK [data] – (xp,yp)	8CSK [data] – (xp,yp)	16CSK [data] – (xp,yp)
110	(0.730 0.270)	[0 0] --> (0.190 0.780)	[0 0 0] --> (0.190 0.780)	[0 0 0 0] --> (0.190 0.780)
010	(0.190 0.780)	[0 1] --> (0.337 0.393)	[0 0 1] --> (0.157 0.563)	[0 0 0 1] --> (0.239 0.651)
001	(0.090 0.130)	[1 0] --> (0.090 0.130)	[0 1 0] --> (0.370 0.610)	[0 0 1 0] --> (0.157 0.563)
		[1 1] --> (0.730 0.270)	[0 1 1] --> (0.509 0.396)	[0 0 1 1] --> (0.370 0.610)
			[1 0 0] --> (0.090 0.130)	[0 1 0 0] --> (0.206 0.434)
			[1 0 1] --> (0.189 0.326)	[0 1 0 1] --> (0.337 0.393)
			[1 1 0] --> (0.410 0.200)	[0 1 1 0] --> (0.419 0.481)
			[1 1 1] --> (0.730 0.270)	[0 1 1 1] --> (0.386 0.264)
				[1 0 0 0] --> (0.123 0.347)
				[1 0 0 1] --> (0.172 0.218)
				[1 0 1 0] --> (0.090 0.130)
				[1 0 1 1] --> (0.303 0.177)
				[1 1 0 0] --> (0.550 0.440)
				[1 1 0 1] --> (0.599 0.311)
				[1 1 1 0] --> (0.517 0.223)
				[1 1 1 1] --> (0.730 0.270)

# Constellations for (110-010-001)



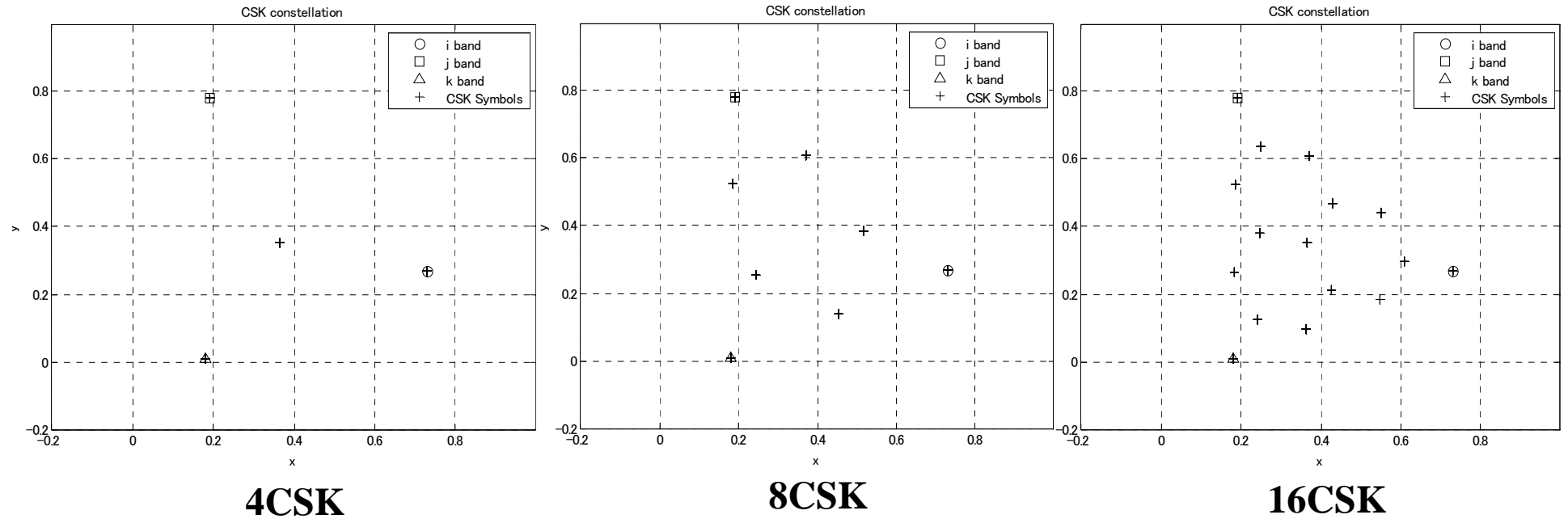
# Color band combination for CSK (110-010-000)



# CSK xy coordinates values (110-010-000)

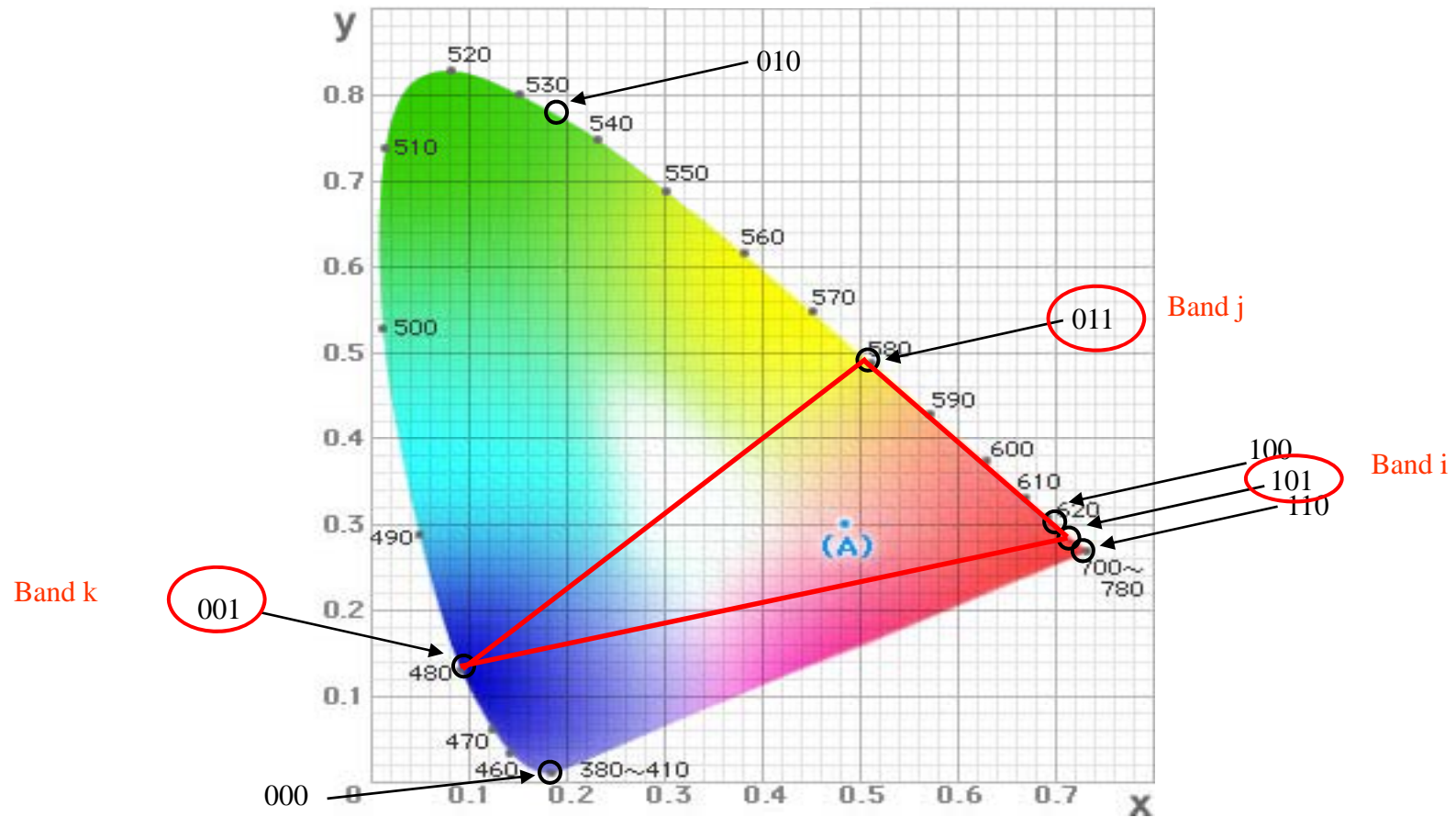
Color band combination (No.4)		xy coordinates values of symbols		
Color codes	Center of band (x,y)	4CSK [data] – (xp,yp)	8CSK [data] – (xp,yp)	16CSK [data] – (xp,yp)
110	(0.730 0.270)	[0 0] - (0.190 0.780)	[0 0 0] - (0.190 0.780)	[0 0 0 0] - (0.190 0.780)
010	(0.190 0.780)	[0 1] - (0.367 0.353)	[0 0 1] - (0.187 0.523)	[0 0 0 1] - (0.249 0.638)
000	(0.180 0.010)	[1 0] - (0.180 0.010)	[0 1 0] - (0.370 0.610)	[0 0 1 0] - (0.187 0.523)
		[1 1] - (0.730 0.270)	[0 1 1] - (0.519 0.383)	[0 0 1 1] - (0.370 0.610)
			[1 0 0] - (0.180 0.010)	[0 1 0 0] - (0.246 0.381)
			[1 0 1] - (0.244 0.253)	[0 1 0 1] - (0.367 0.353)
			[1 1 0] - (0.455 0.140)	[0 1 1 0] - (0.429 0.468)
			[1 1 1] - (0.730 0.270)	[0 1 1 1] - (0.426 0.211)
				[1 0 0 0] - (0.183 0.267)
				[1 0 0 1] - (0.242 0.124)
				[1 0 1 0] - (0.180 0.010)
				[1 0 1 1] - (0.363 0.097)
				[1 1 0 0] - (0.550 0.440)
				[1 1 0 1] - (0.609 0.298)
				[1 1 1 0] - (0.547 0.183)
				[1 1 1 1] - (0.730 0.270)

# Constellations for (110-010-000)





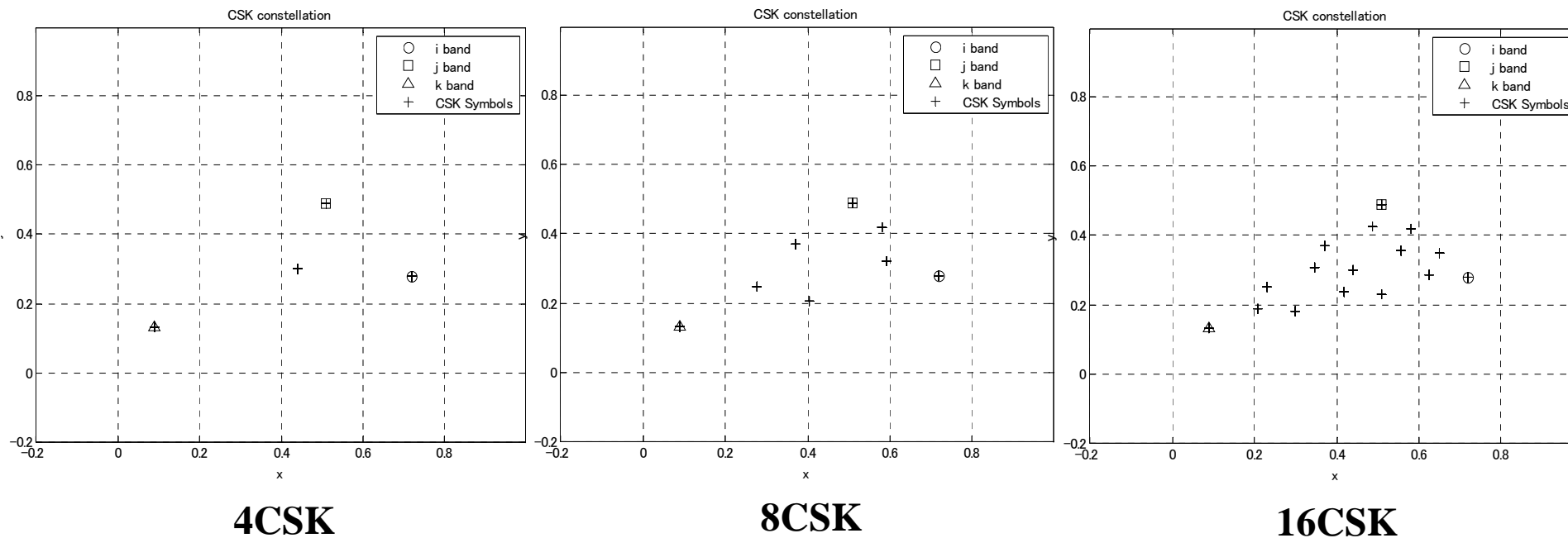
# Color band combination for CSK (101-011-001)



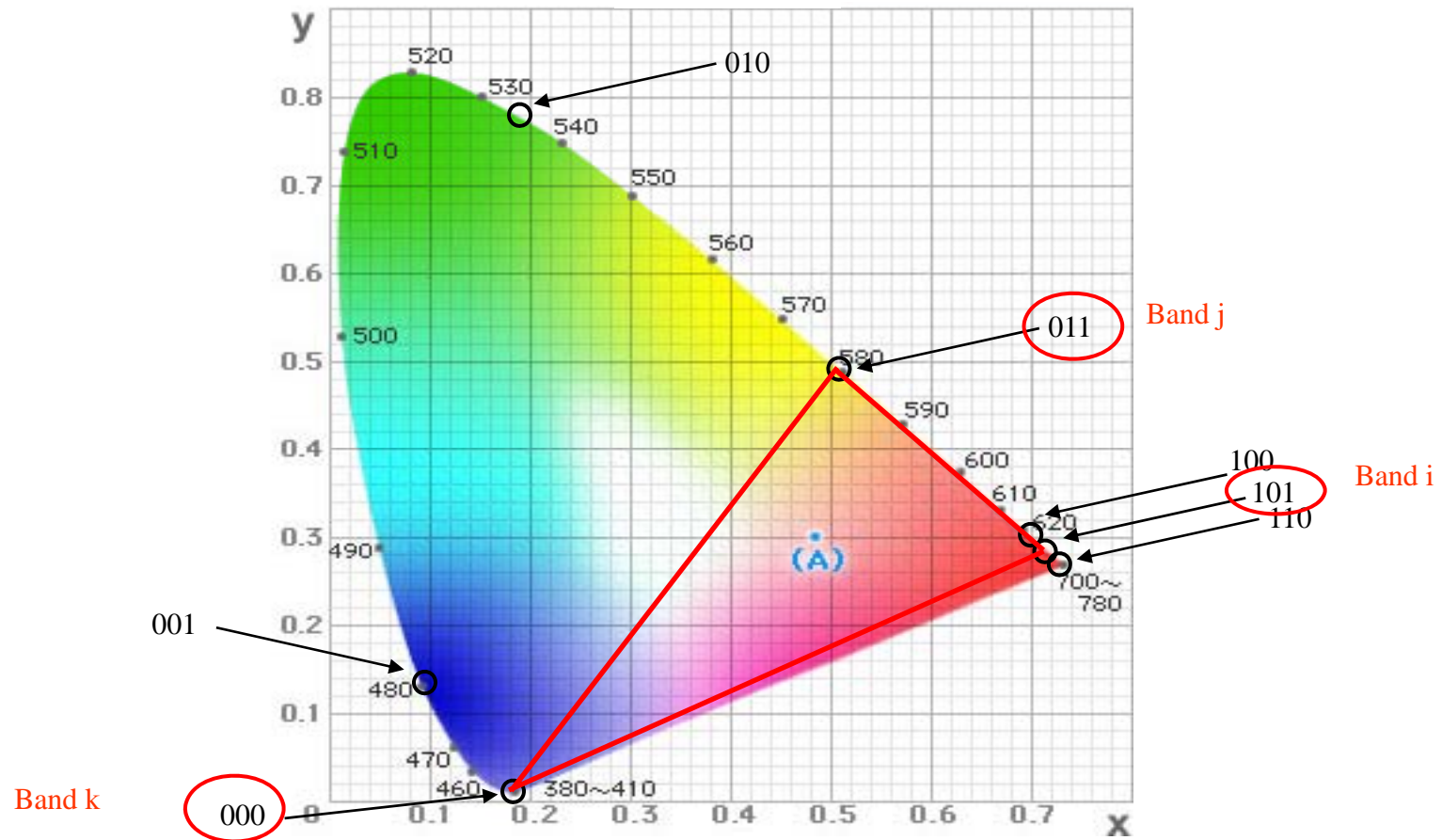
# CSK xy coordinates values (101-011-001)

Color band combination (No.5)		xy coordinates values of symbols		
Color codes	Center of band (x,y)	4CSK [data] – (xp,yp)	8CSK [data] – (xp,yp)	16CSK [data] – (xp,yp)
101	(0.720 0.280)	[0 0] --> (0.510 0.490)	[0 0 0] --> (0.510 0.490)	[0 0 0 0] --> (0.510 0.490)
011	(0.510 0.490)	[0 1] --> (0.440 0.300)	[0 0 1] --> (0.370 0.370)	[0 0 0 1] --> (0.487 0.427)
001	(0.090 0.130)	[1 0] --> (0.090 0.130)	[0 1 0] --> (0.580 0.420)	[0 0 1 0] --> (0.370 0.370)
		[1 1] --> (0.720 0.280)	[0 1 1] --> (0.592 0.322)	[0 0 1 1] --> (0.580 0.420)
			[1 0 0] --> (0.090 0.130)	[0 1 0 0] --> (0.347 0.307)
			[1 0 1] --> (0.277 0.247)	[0 1 0 1] --> (0.440 0.300)
			[1 1 0] --> (0.405 0.205)	[0 1 1 0] --> (0.557 0.357)
			[1 1 1] --> (0.720 0.280)	[0 1 1 1] --> (0.417 0.237)
				[1 0 0 0] --> (0.230 0.250)
				[1 0 0 1] --> (0.207 0.187)
				[1 0 1 0] --> (0.090 0.130)
				[1 0 1 1] --> (0.300 0.180)
				[1 1 0 0] --> (0.650 0.350)
				[1 1 0 1] --> (0.627 0.287)
				[1 1 1 0] --> (0.510 0.230)
				[1 1 1 1] --> (0.720 0.280)

# Constellations for (101-011-001)



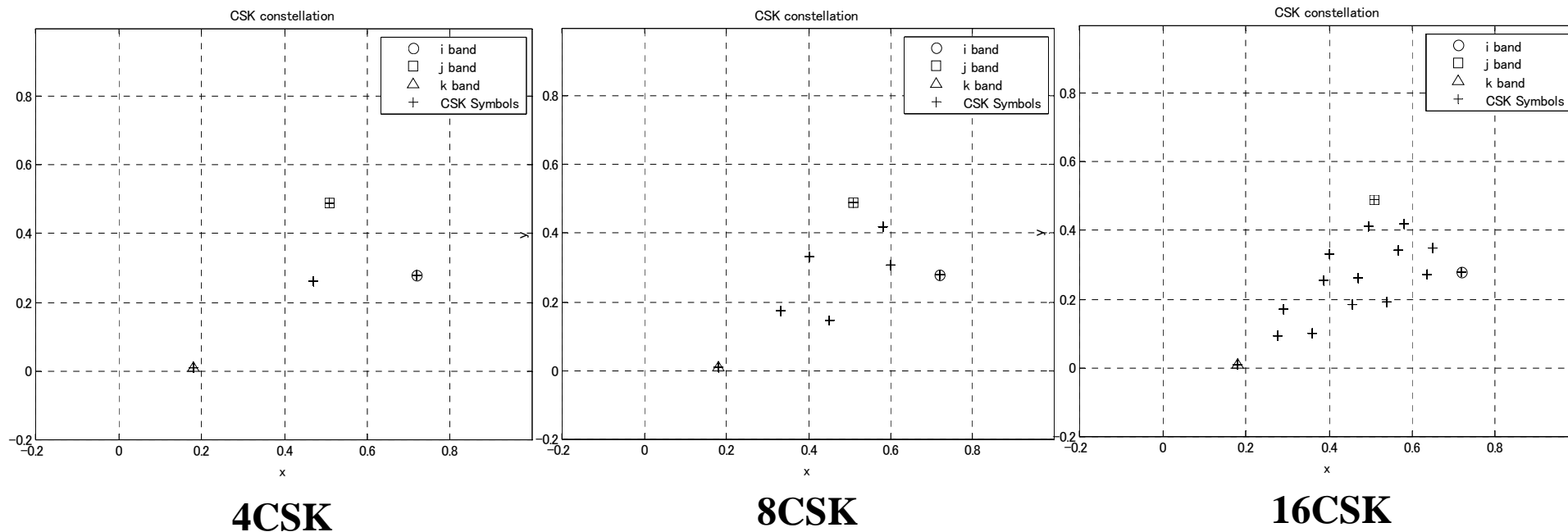
# Color band combination for CSK (101-011-000)



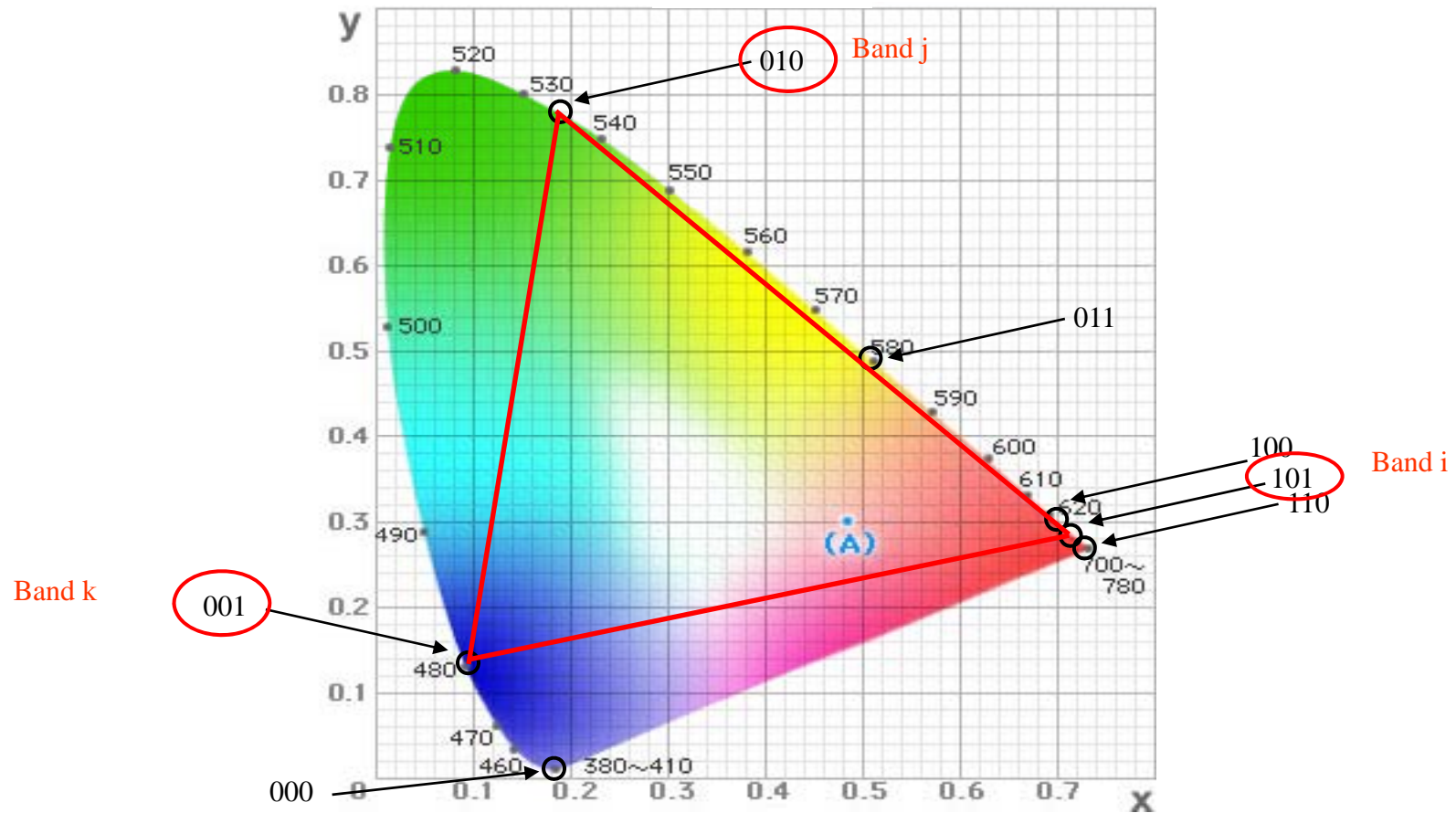
# CSK xy coordinates values (101-011-000)

Color band combination (No6)		xy coordinates values of symbols		
Color codes	Center of band (x,y)	4CSK [data] – (xp,yp)	8CSK [data] – (xp,yp)	16CSK [data] – (xp,yp)
101	(0.720 0.280)	[0 0] --> (0.510 0.490)	[0 0 0] --> (0.510 0.490)	[0 0 0 0] --> (0.510 0.490)
011	(0.510 0.490)	[0 1] --> (0.470 0.260)	[0 0 1] --> (0.400 0.330)	[0 0 0 1] --> (0.497 0.413)
000	(0.180 0.010)	[1 0] --> (0.180 0.010)	[0 1 0] --> (0.580 0.420)	[0 0 1 0] --> (0.400 0.330)
		[1 1] --> (0.720 0.280)	[0 1 1] --> (0.602 0.308)	[0 0 1 1] --> (0.580 0.420)
			[1 0 0] --> (0.180 0.010)	[0 1 0 0] --> (0.387 0.253)
			[1 0 1] --> (0.332 0.173)	[0 1 0 1] --> (0.470 0.260)
			[1 1 0] --> (0.450 0.145)	[0 1 1 0] --> (0.567 0.343)
			[1 1 1] --> (0.720 0.280)	[0 1 1 1] --> (0.457 0.183)
				[1 0 0 0] --> (0.290 0.170)
				[1 0 0 1] --> (0.277 0.093)
				[1 0 1 0] --> (0.180 0.010)
				[1 0 1 1] --> (0.360 0.100)
				[1 1 0 0] --> (0.650 0.350)
				[1 1 0 1] --> (0.637 0.273)
				[1 1 1 0] --> (0.540 0.190)
				[1 1 1 1] --> (0.720 0.280)

# Constellations for (101-011-000)



# Color band combination for CSK (101-010-001)

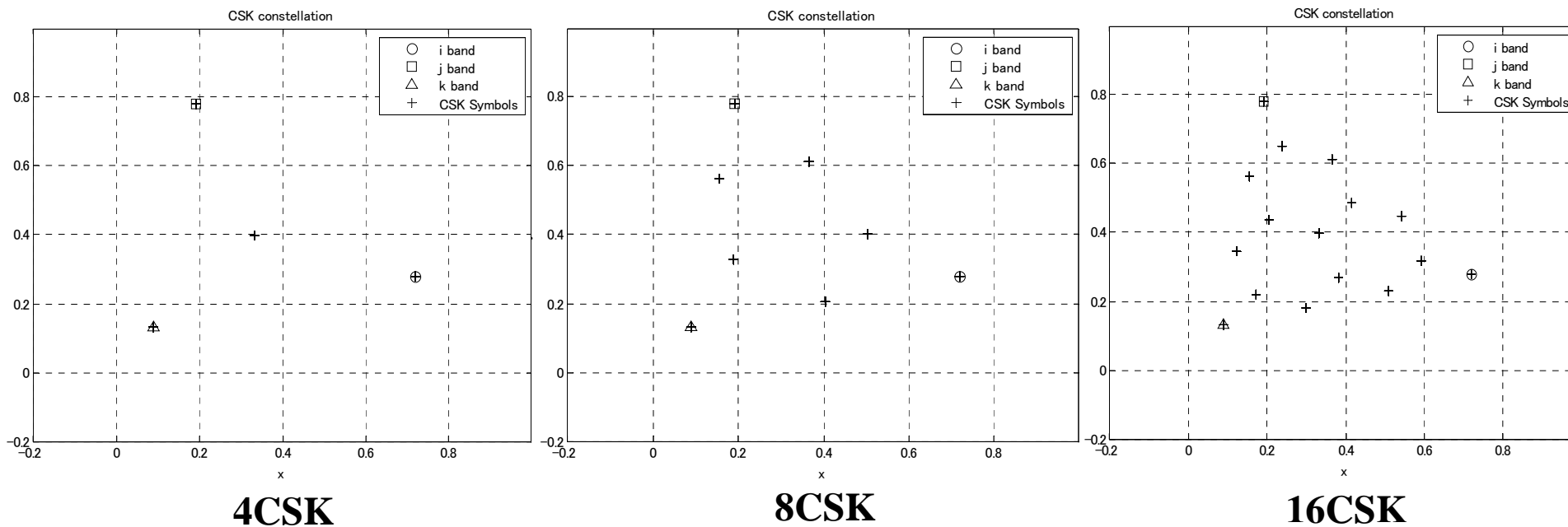


# CSK xy coordinates values (101-010-001)

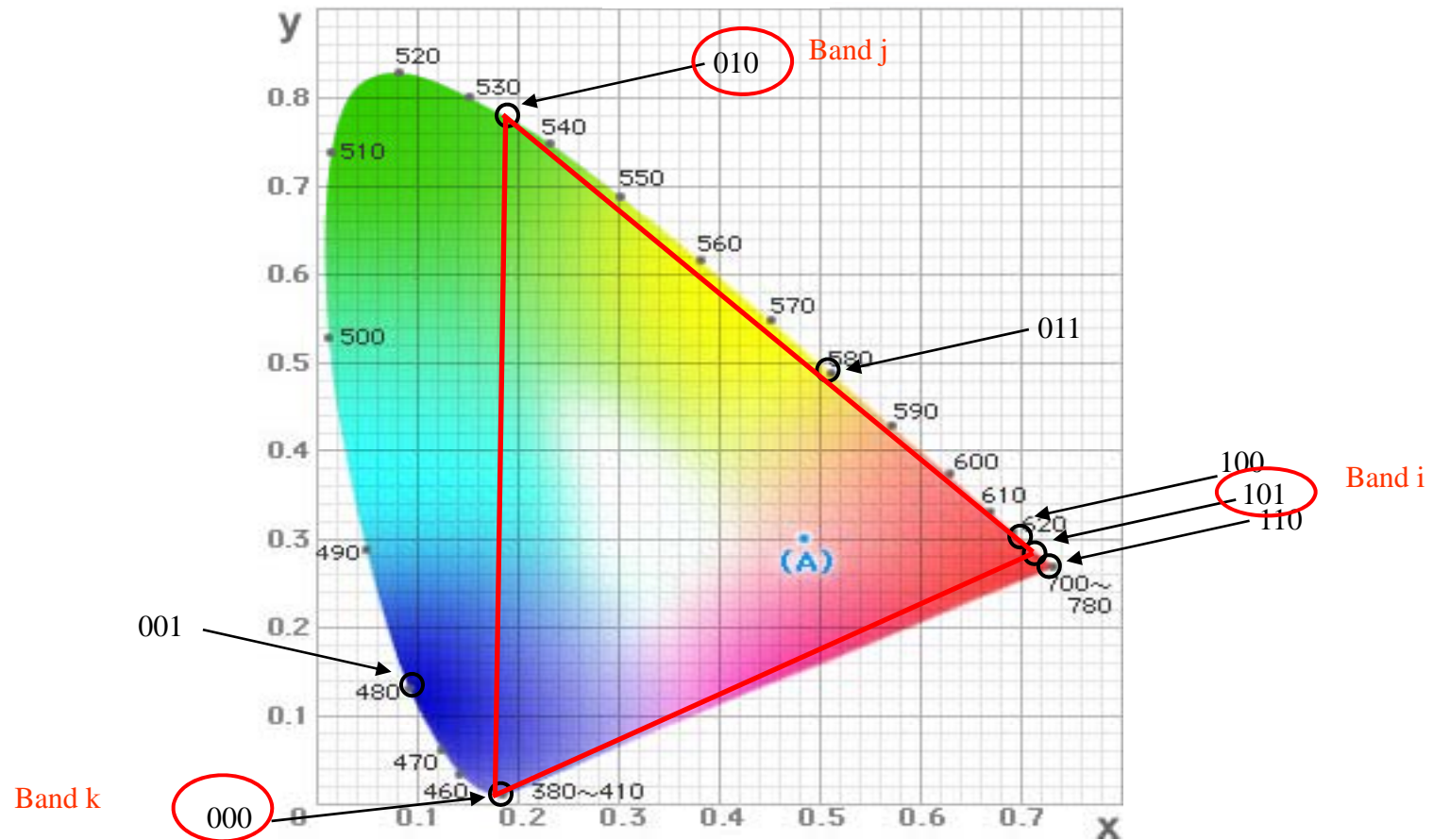
Color band combination (No7)		xy coordinates values of symbols		
Color codes	Center of band (x,y)	4CSK [data] – (xp,yp)	8CSK [data] – (xp,yp)	16CSK [data] – (xp,yp)
101	(0.720 0.280)	[0 0] --> (0.190 0.780)	[0 0 0] --> (0.190 0.780)	[0 0 0 0] --> (0.190 0.780)
010	(0.190 0.780)	[0 1] --> (0.333 0.397)	[0 0 1] --> (0.157 0.563)	[0 0 0 1] --> (0.238 0.652)
001	(0.090 0.130)	[1 0] --> (0.090 0.130)	[0 1 0] --> (0.367 0.613)	[0 0 1 0] --> (0.157 0.563)
		[1 1] --> (0.720 0.280)	[0 1 1] --> (0.503 0.402)	[0 0 1 1] --> (0.367 0.613)
			[1 0 0] --> (0.090 0.130)	[0 1 0 0] --> (0.204 0.436)
			[1 0 1] --> (0.188 0.327)	[0 1 0 1] --> (0.333 0.397)
			[1 1 0] --> (0.405 0.205)	[0 1 1 0] --> (0.414 0.486)
			[1 1 1] --> (0.720 0.280)	[0 1 1 1] --> (0.381 0.269)
				[1 0 0 0] --> (0.123 0.347)
				[1 0 0 1] --> (0.171 0.219)
				[1 0 1 0] --> (0.090 0.130)
				[1 0 1 1] --> (0.300 0.180)
				[1 1 0 0] --> (0.543 0.447)
				[1 1 0 1] --> (0.591 0.319)
				[1 1 1 0] --> (0.510 0.230)
				[1 1 1 1] --> (0.720 0.280)



# Constellations for (101-010-001)



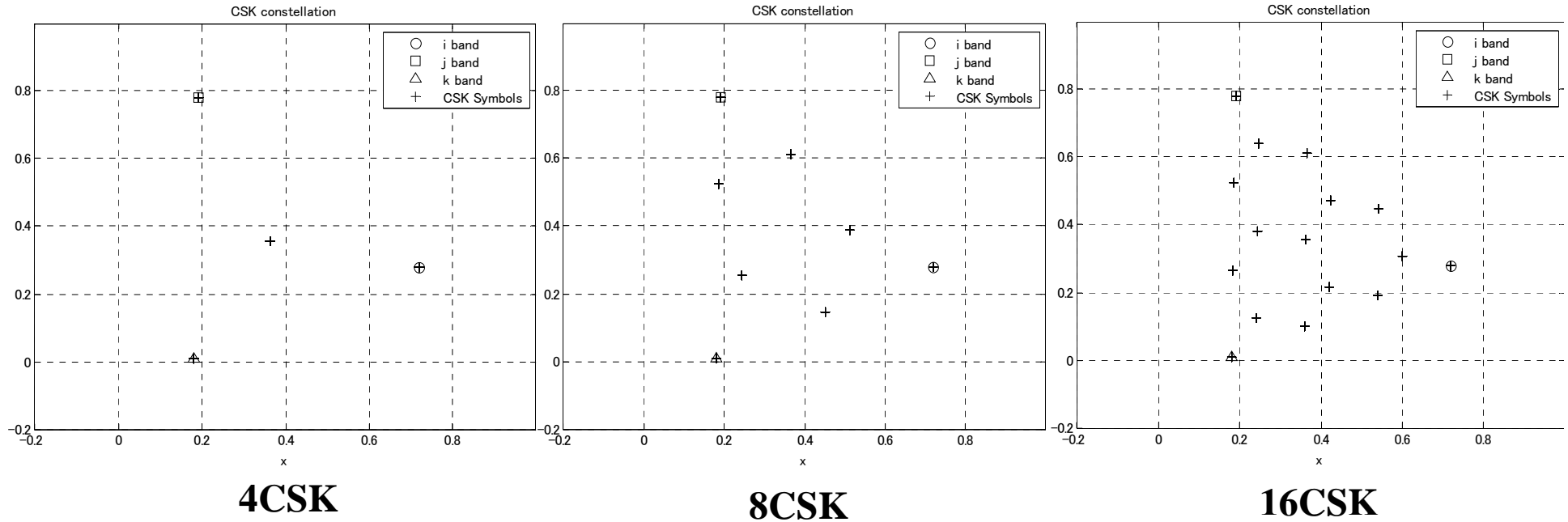
# Color band combination for CSK (101-010-000)



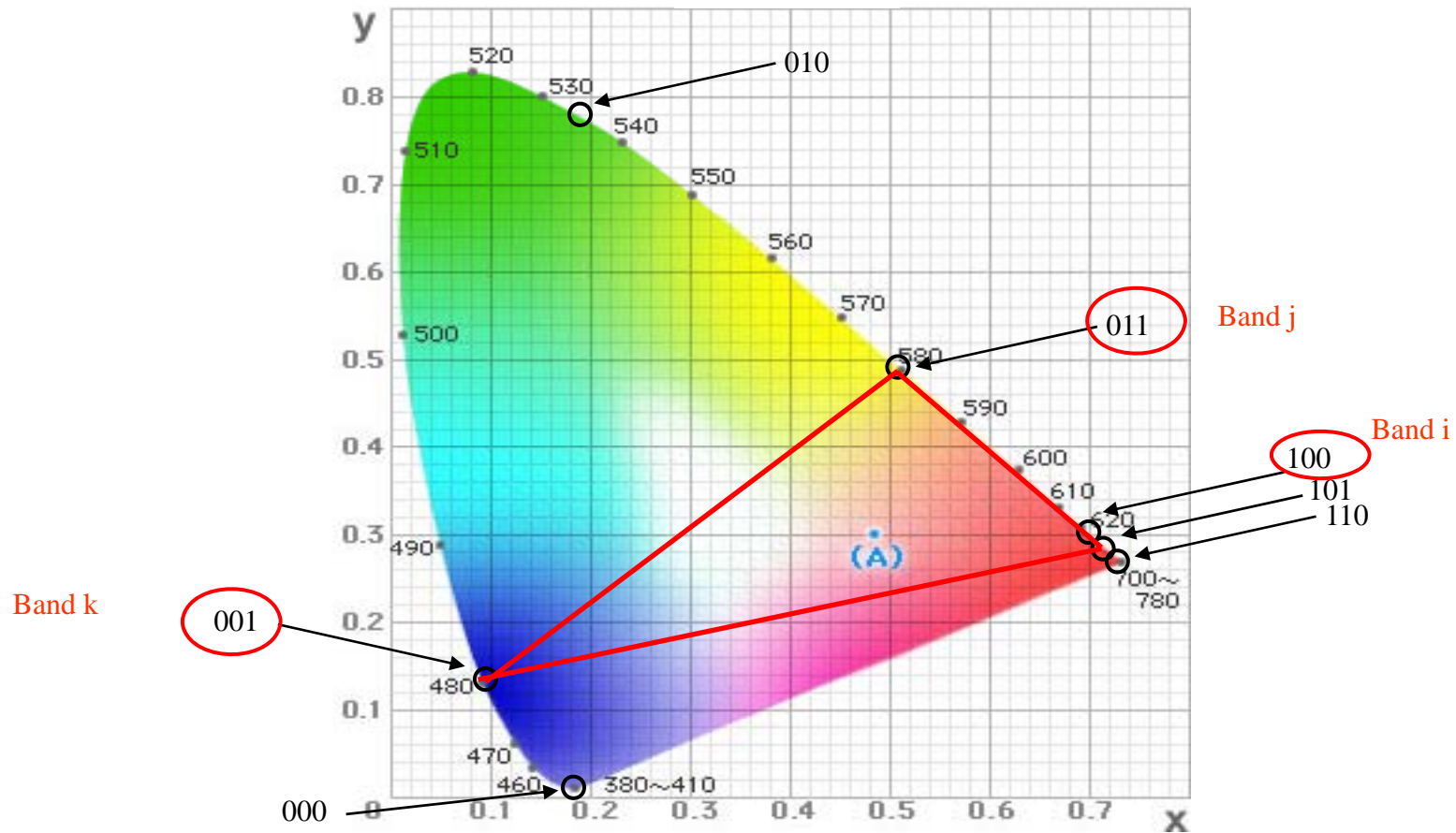
# CSK xy coordinates values (101-010-000)

Color band combination (No8)		xy coordinates values of symbols		
Color codes	Center of band (x,y)	4CSK [data] – (xp,yp)	8CSK [data] – (xp,yp)	16CSK [data] – (xp,yp)
101	(0.720 0.280)	[0 0] --> (0.190 0.780)	[0 0 0] --> (0.190 0.780)	[0 0 0 0] --> (0.190 0.780)
010	(0.190 0.780)	[0 1] --> (0.363 0.357)	[0 0 1] --> (0.187 0.523)	[0 0 0 1] --> (0.248 0.639)
000	(0.180 0.010)	[1 0] --> (0.180 0.010)	[0 1 0] --> (0.367 0.613)	[0 0 1 0] --> (0.187 0.523)
		[1 1] --> (0.720 0.280)	[0 1 1] --> (0.513 0.389)	[0 0 1 1] --> (0.367 0.613)
			[1 0 0] --> (0.180 0.010)	[0 1 0 0] --> (0.244 0.382)
			[1 0 1] --> (0.243 0.254)	[0 1 0 1] --> (0.363 0.357)
			[1 1 0] --> (0.450 0.145)	[0 1 1 0] --> (0.424 0.472)
			[1 1 1] --> (0.720 0.280)	[0 1 1 1] --> (0.421 0.216)
				[1 0 0 0] --> (0.183 0.267)
				[1 0 0 1] --> (0.241 0.126)
				[1 0 1 0] --> (0.180 0.010)
				[1 0 1 1] --> (0.360 0.100)
				[1 1 0 0] --> (0.543 0.447)
				[1 1 0 1] --> (0.601 0.306)
				[1 1 1 0] --> (0.540 0.190)
				[1 1 1 1] --> (0.720 0.280)

# Constellations for (101-010-000)



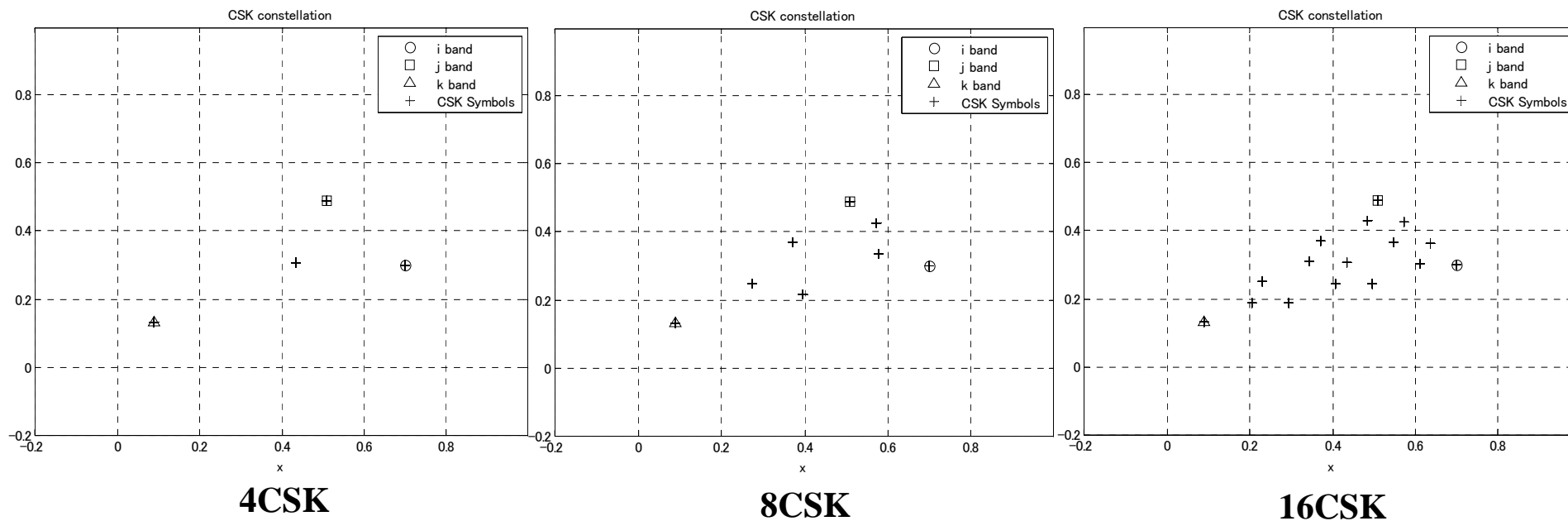
# Color band combination for CSK (100-011-001)



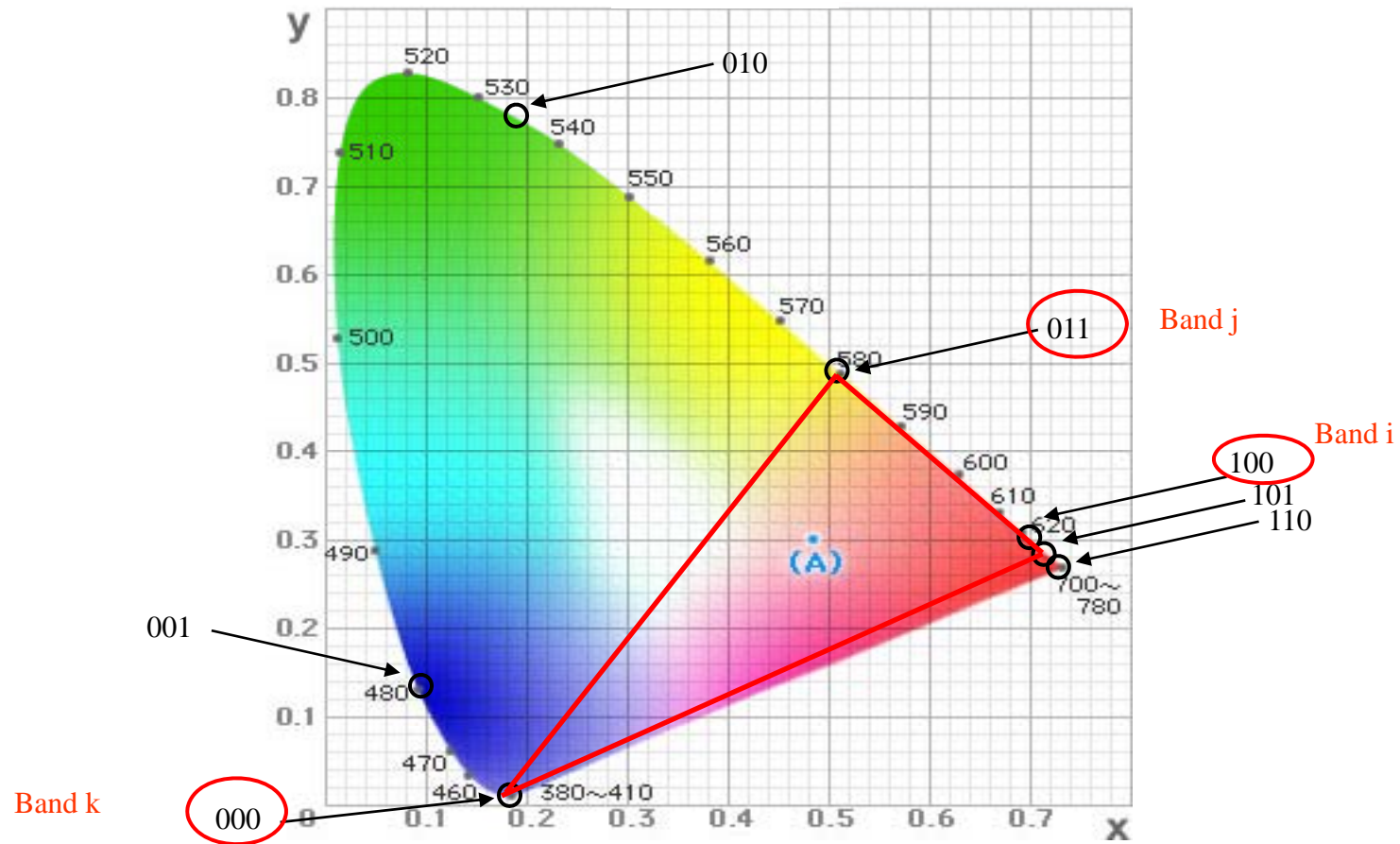
# CSK xy coordinates values (100-011-001)

Color band combination (No9)		xy coordinates values of symbols		
Color codes	Center of band (x,y)	4CSK [data] – (xp,yp)	8CSK [data] – (xp,yp)	16CSK [data] – (xp,yp)
100	(0.700 0.300)	[0 0] --> (0.510 0.490)	[0 0 0] --> (0.510 0.490)	[0 0 0 0] --> (0.510 0.490)
011	(0.510 0.490)	[0 1] --> (0.433 0.307)	[0 0 1] --> (0.370 0.370)	[0 0 0 1] --> (0.484 0.429)
001	(0.090 0.130)	[1 0] --> (0.090 0.130)	[0 1 0] --> (0.573 0.427)	[0 0 1 0] --> (0.370 0.370)
		[1 1] --> (0.700 0.300)	[0 1 1] --> (0.579 0.334)	[0 0 1 1] --> (0.573 0.427)
			[1 0 0] --> (0.090 0.130)	[0 1 0 0] --> (0.344 0.309)
			[1 0 1] --> (0.274 0.249)	[0 1 0 1] --> (0.433 0.307)
			[1 1 0] --> (0.395 0.215)	[0 1 1 0] --> (0.548 0.366)
			[1 1 1] --> (0.700 0.300)	[0 1 1 1] --> (0.408 0.246)
				[1 0 0 0] --> (0.230 0.250)
				[1 0 0 1] --> (0.204 0.189)
				[1 0 1 0] --> (0.090 0.130)
				[1 0 1 1] --> (0.293 0.187)
				[1 1 0 0] --> (0.637 0.363)
				[1 1 0 1] --> (0.611 0.302)
				[1 1 1 0] --> (0.497 0.243)
				[1 1 1 1] --> (0.700 0.300)

# Constellations for (100-011-001)



# Color band combination for CSK (100-011-000)

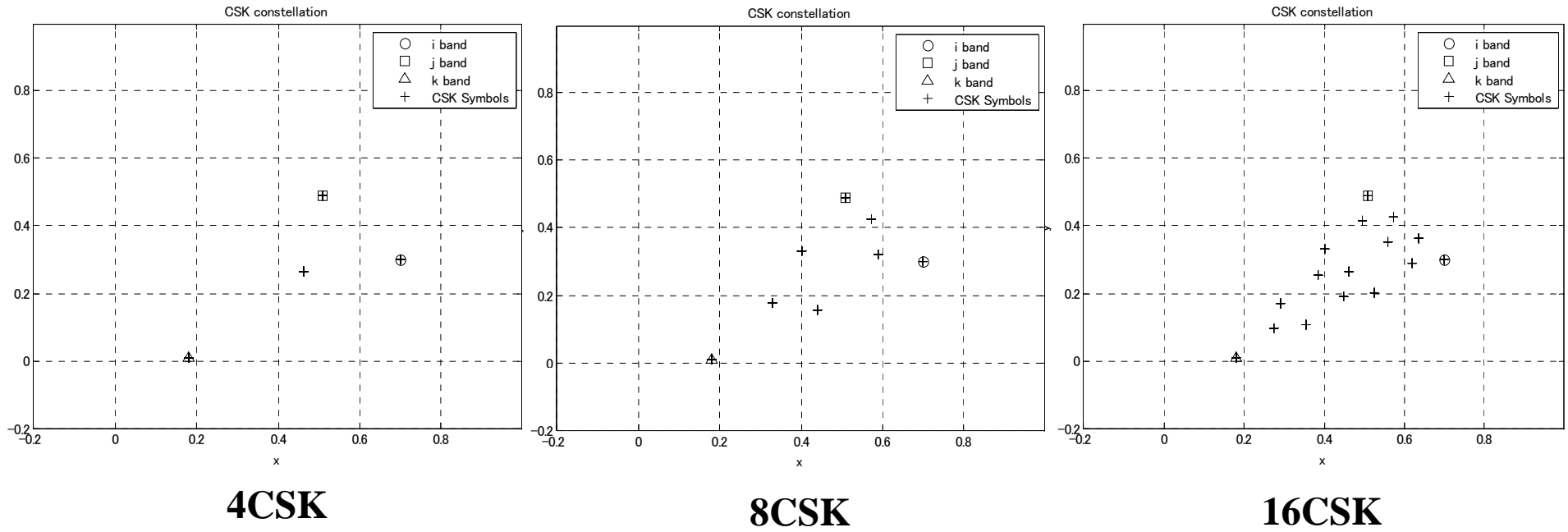




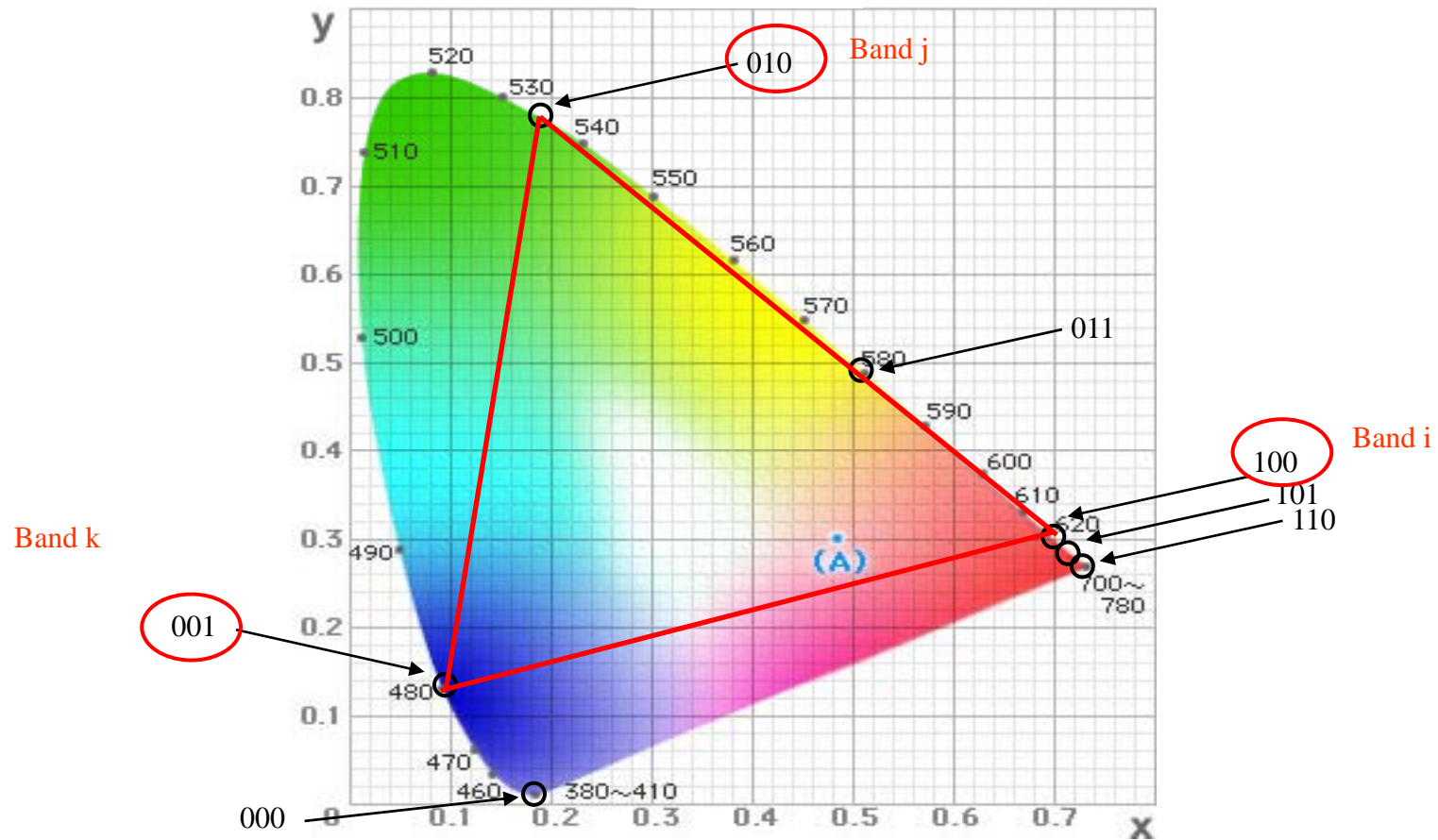
# CSK xy coordinates values (100-011-000)

Color band combination (No10)		xy coordinates values of symbols		
Color codes	Center of band (x,y)	4CSK [data] – (xp,yp)	8CSK [data] – (xp,yp)	16CSK [data] – (xp,yp)
100	(0.700 0.300)	[0 0] --> (0.510 0.490)	[0 0 0] --> (0.510 0.490)	[0 0 0 0] --> (0.510 0.490)
011	(0.510 0.490)	[0 1] --> (0.463 0.267)	[0 0 1] --> (0.400 0.330)	[0 0 0 1] --> (0.494 0.416)
000	(0.180 0.010)	[1 0] --> (0.180 0.010)	[0 1 0] --> (0.573 0.427)	[0 0 1 0] --> (0.400 0.330)
		[1 1] --> (0.700 0.300)	[0 1 1] --> (0.589 0.321)	[0 0 1 1] --> (0.573 0.427)
			[1 0 0] --> (0.180 0.010)	[0 1 0 0] --> (0.384 0.256)
			[1 0 1] --> (0.329 0.176)	[0 1 0 1] --> (0.463 0.267)
			[1 1 0] --> (0.440 0.155)	[0 1 1 0] --> (0.558 0.352)
			[1 1 1] --> (0.700 0.300)	[0 1 1 1] --> (0.448 0.192)
				[1 0 0 0] --> (0.290 0.170)
				[1 0 0 1] --> (0.274 0.096)
				[1 0 1 0] --> (0.180 0.010)
				[1 0 1 1] --> (0.353 0.107)
				[1 1 0 0] --> (0.637 0.363)
				[1 1 0 1] --> (0.621 0.289)
				[1 1 1 0] --> (0.527 0.203)
				[1 1 1 1] --> (0.700 0.300)

# Constellations for (100-011-000)



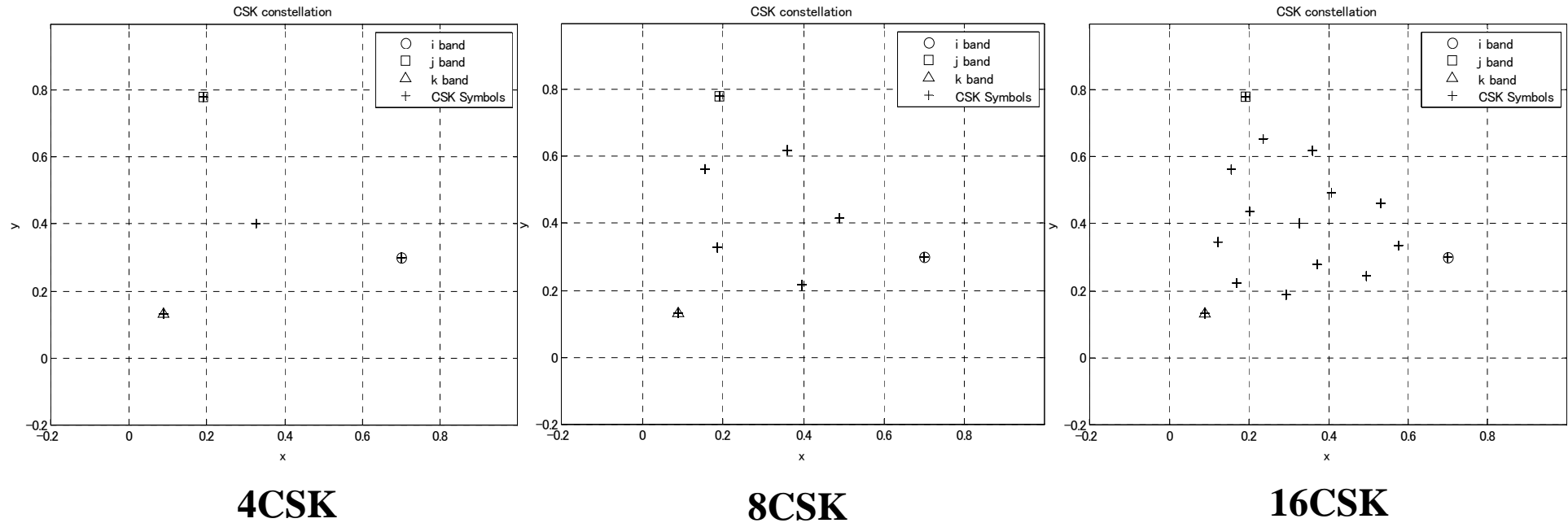
# Color band combination for CSK (100-010-001)



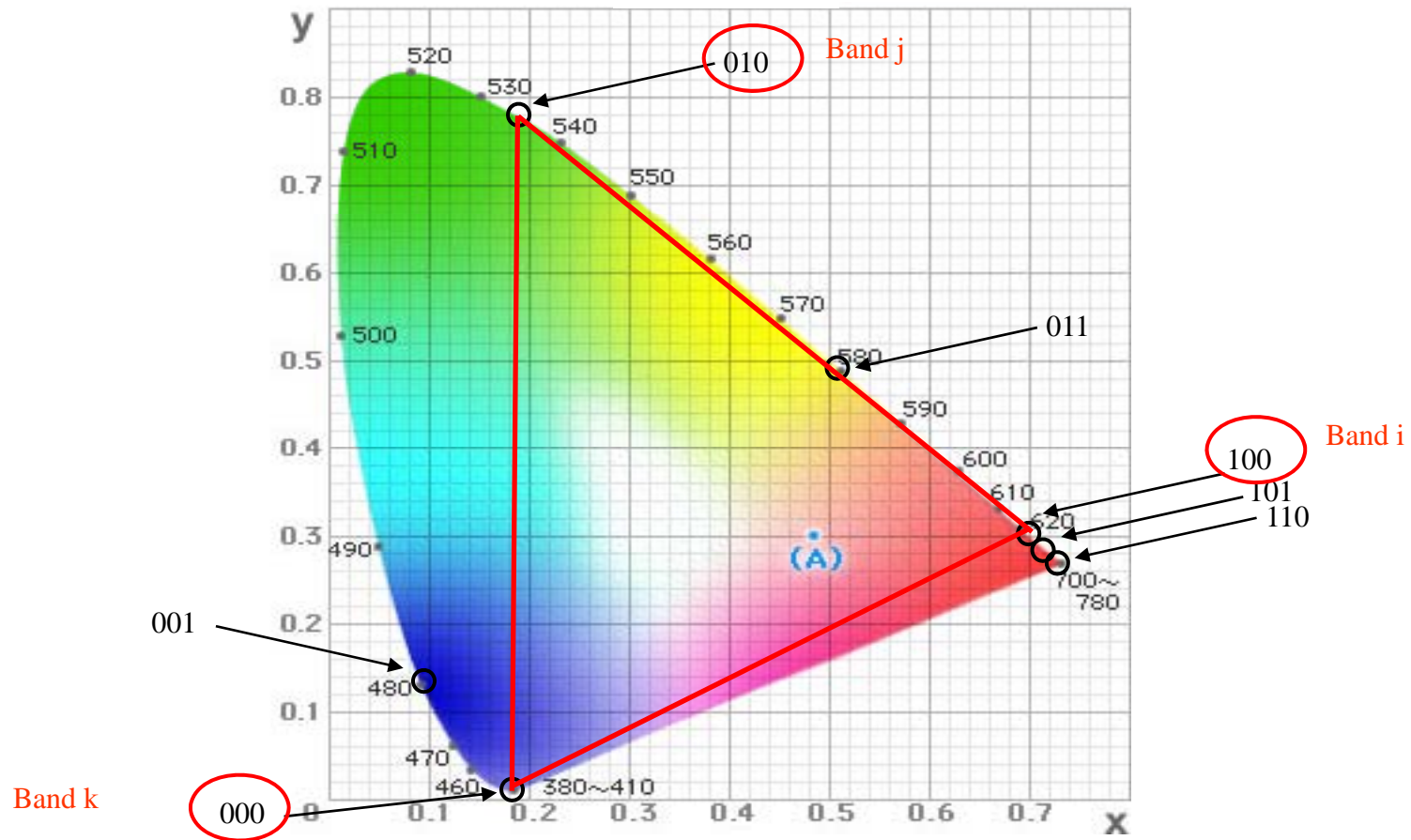
# CSK xy coordinates values (110-010-001)

Color band combination (No.11)		xy coordinates values of symbols		
Color codes	Center of band (x,y)	4CSK [data] – (xp,yp)	8CSK [data] – (xp,yp)	16CSK [data] – (xp,yp)
100	(0.700 0.300)	[0 0] - (0.190 0.780)	[0 0 0] - (0.190 0.780)	[0 0 0 0] - (0.190 0.780)
010	(0.190 0.780)	[0 1] - (0.327 0.403)	[0 0 1] - (0.157 0.563)	[0 0 0 1] - (0.236 0.654)
001	(0.090 0.130)	[1 0] - (0.090 0.130)	[0 1 0] - (0.360 0.620)	[0 0 1 0] - (0.157 0.563)
		[1 1] - (0.700 0.300)	[0 1 1] - (0.491 0.414)	[0 0 1 1] - (0.360 0.620)
			[1 0 0] - (0.090 0.130)	[0 1 0 0] - (0.202 0.438)
			[1 0 1] - (0.186 0.329)	[0 1 0 1] - (0.327 0.403)
			[1 1 0] - (0.395 0.215)	[0 1 1 0] - (0.406 0.494)
			[1 1 1] - (0.700 0.300)	[0 1 1 1] - (0.372 0.278)
				[1 0 0 0] - (0.123 0.347)
				[1 0 0 1] - (0.169 0.221)
				[1 0 1 0] - (0.090 0.130)
				[1 0 1 1] - (0.293 0.187)
				[1 1 0 0] - (0.530 0.460)
				[1 1 0 1] - (0.576 0.334)
				[1 1 1 0] - (0.497 0.243)
				[1 1 1 1] - (0.700 0.300)

# Constellations for (100-010-001)



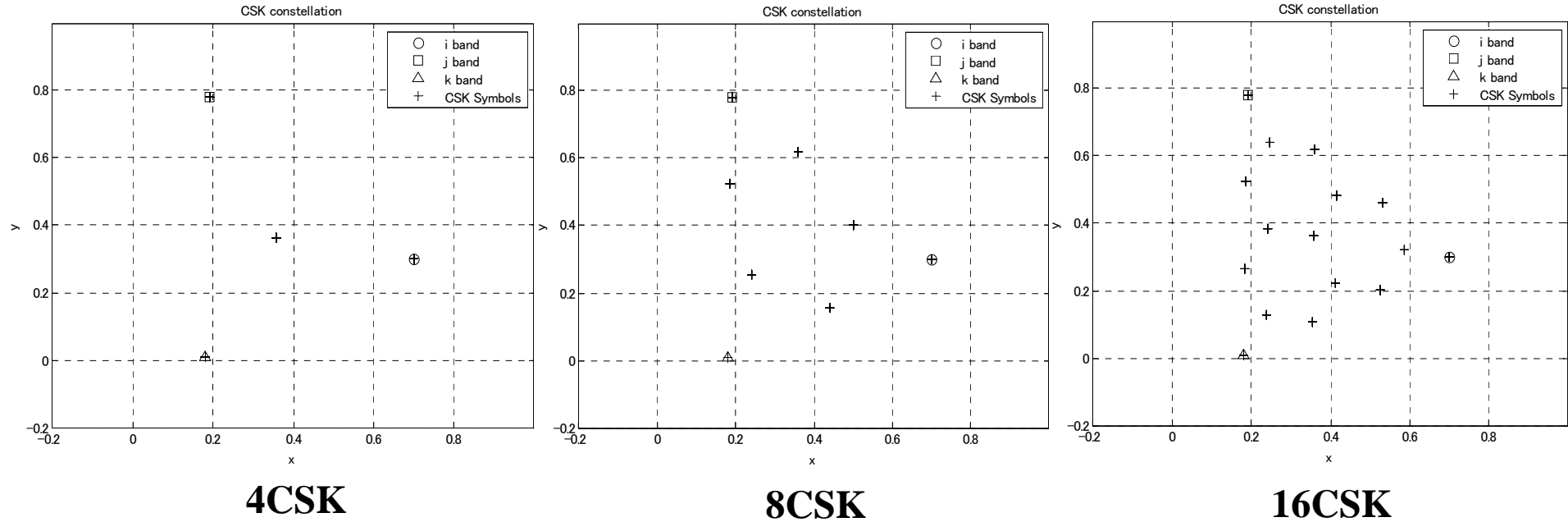
# Color band combination for CSK (100-010-000)



# CSK xy coordinates values [110-010-000]

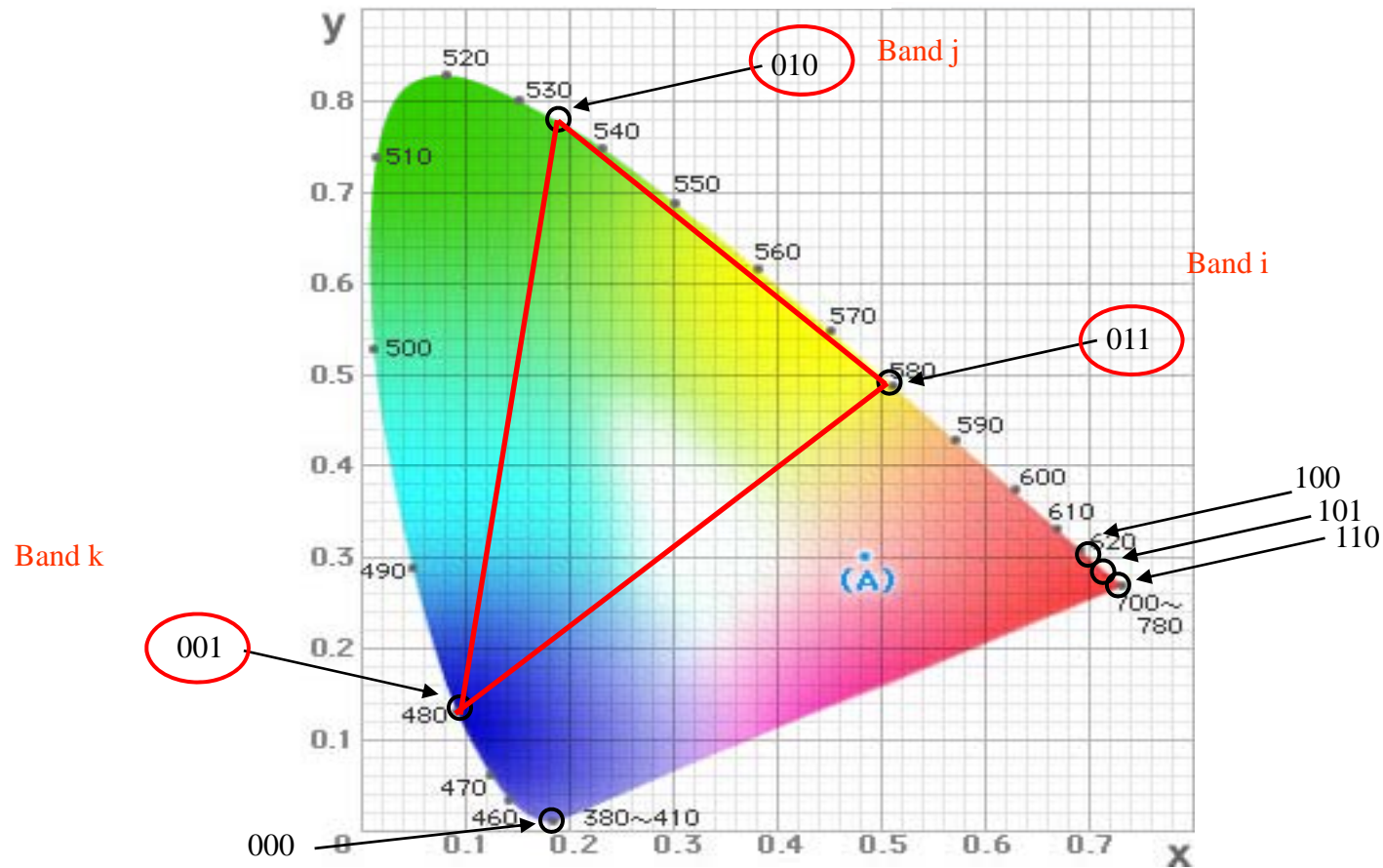
Color band combination (No.12)		xy coordinates values of symbols		
Color codes	Center of band (x,y)	4CSK [data] – (xp,yp)	8CSK [data] – (xp,yp)	16CSK [data] – (xp,yp)
100	(0.700 0.300)	[0 0] --> (0.190 0.780)	[0 0 0] --> (0.190 0.780)	[0 0 0 0] --> (0.190 0.780)
010	(0.190 0.780)	[0 1] --> (0.357 0.363)	[0 0 1] --> (0.187 0.523)	[0 0 0 1] --> (0.246 0.641)
000	(0.180 0.010)	[1 0] --> (0.180 0.010)	[0 1 0] --> (0.360 0.620)	[0 0 1 0] --> (0.187 0.523)
		[1 1] --> (0.700 0.300)	[0 1 1] --> (0.501 0.401)	[0 0 1 1] --> (0.360 0.620)
			[1 0 0] --> (0.180 0.010)	[0 1 0 0] --> (0.242 0.384)
			[1 0 1] --> (0.241 0.256)	[0 1 0 1] --> (0.357 0.363)
			[1 1 0] --> (0.440 0.155)	[0 1 1 0] --> (0.416 0.481)
			[1 1 1] --> (0.700 0.300)	[0 1 1 1] --> (0.412 0.224)
				[1 0 0 0] --> (0.183 0.267)
				[1 0 0 1] --> (0.239 0.128)
				[1 0 1 0] --> (0.180 0.010)
				[1 0 1 1] --> (0.353 0.107)
				[1 1 0 0] --> (0.530 0.460)
				[1 1 0 1] --> (0.586 0.321)
				[1 1 1 0] --> (0.527 0.203)
				[1 1 1 1] --> (0.700 0.300)

# Constellations for (100-010-000)





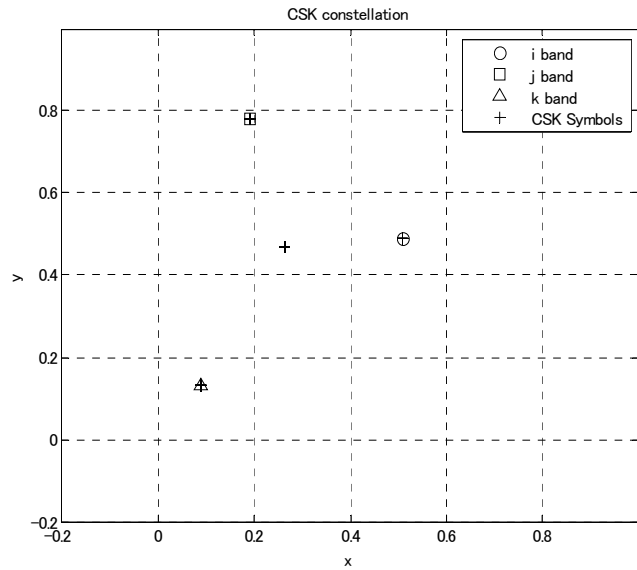
# Color band combination for CSK (011-010-001)



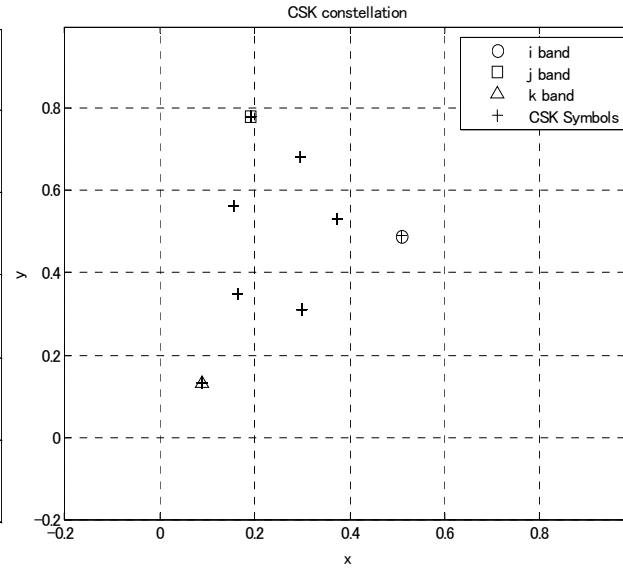
# CSK xy coordinates values (110-010-001)

Color band combination (No.13)		xy coordinates values of symbols		
Color codes	Center of band (x,y)	4CSK [data] - (xp,yp)	8CSK [data] - (xp,yp)	16CSK [data] - (xp,yp)
011	(0.510 0.490)	[0 0] --> (0.190 0.780)	[0 0 0] - (0.190 0.780)	[0 0 0 0] - (0.190 0.780)
010	(0.190 0.780)	[0 1] --> (0.263 0.467)	[0 0 1] - (0.157 0.563)	[0 0 0 1] - (0.214 0.676)
001	(0.090 0.130)	[1 0] --> (0.090 0.130)	[0 1 0] - (0.297 0.683)	[0 0 1 0] - (0.157 0.563)
		[1 1] --> (0.510 0.490)	[0 1 1] - (0.374 0.531)	[0 0 1 1] - (0.297 0.683)
			[1 0 0] - (0.090 0.130)	[0 1 0 0] - (0.181 0.459)
			[1 0 1] - (0.164 0.351)	[0 1 0 1] - (0.263 0.467)
			[1 1 0] - (0.300 0.310)	[0 1 1 0] - (0.321 0.579)
			[1 1 1] - (0.510 0.490)	[0 1 1 1] - (0.288 0.362)
				[1 0 0 0] - (0.123 0.347)
				[1 0 0 1] - (0.148 0.242)
				[1 0 1 0] - (0.090 0.130)
				[1 0 1 1] - (0.230 0.250)
				[1 1 0 0] - (0.403 0.587)
				[1 1 0 1] - (0.428 0.482)
				[1 1 1 0] - (0.370 0.370)
				[1 1 1 1] - (0.510 0.490)

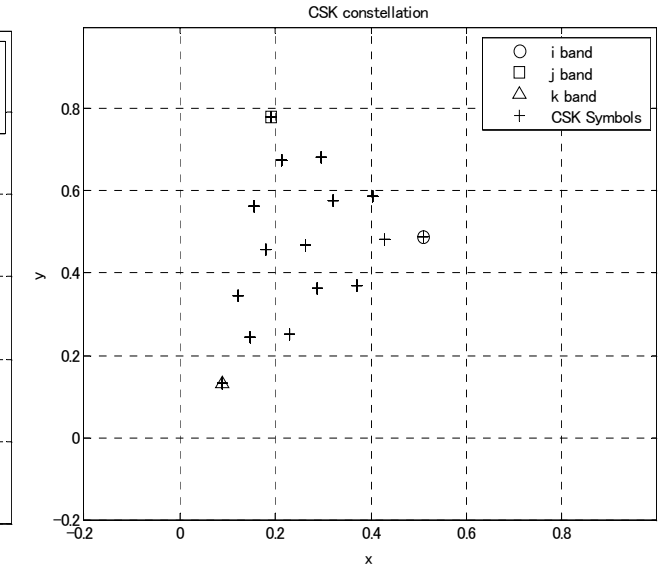
# Constellations for (001-010-001)



**4CSK**

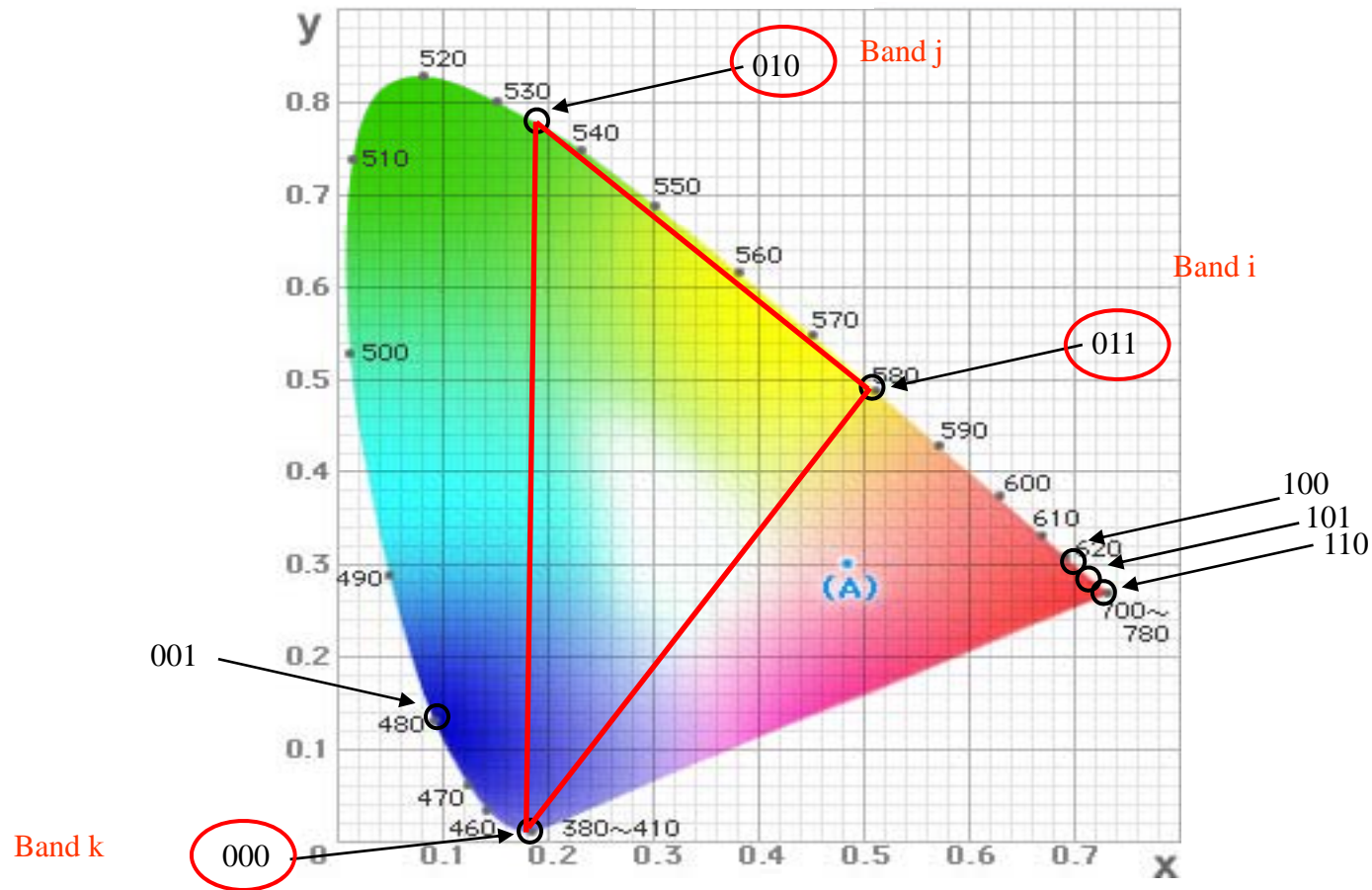


**8CSK**



**16CSK**

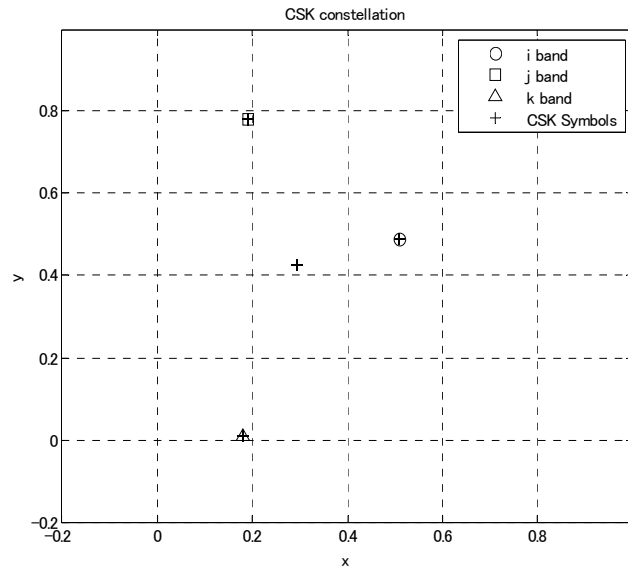
# Color band combination for CSK (011-010-000)



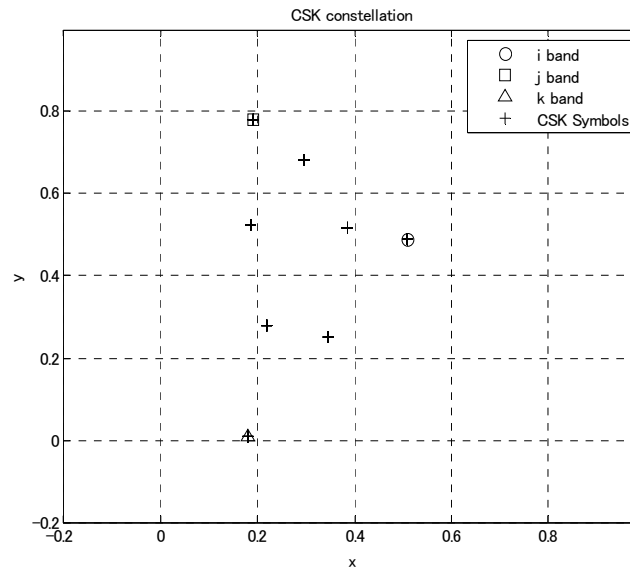
# CSK xy coordinates values [110-010-000]

Color band combination (No.14)		xy coordinates values of symbols		
Color codes	Center of band (x,y)	4CSK [data] – (xp,yp)	8CSK [data] – (xp,yp)	16CSK [data] – (xp,yp)
011	(0.510 0.490)	[0 0] --> (0.190 0.780)	[0 0 0] --> (0.190 0.780)	[0 0 0 0] --> (0.190 0.780)
010	(0.190 0.780)	[0 1] --> (0.293 0.427)	[0 0 1] --> (0.187 0.523)	[0 0 0 1] --> (0.224 0.662)
000	(0.180 0.010)	[1 0] --> (0.180 0.010)	[0 1 0] --> (0.297 0.683)	[0 0 1 0] --> (0.187 0.523)
		[1 1] --> (0.510 0.490)	[0 1 1] --> (0.384 0.517)	[0 0 1 1] --> (0.297 0.683)
			[1 0 0] --> (0.180 0.010)	[0 1 0 0] --> (0.221 0.406)
			[1 0 1] --> (0.219 0.277)	[0 1 0 1] --> (0.293 0.427)
			[1 1 0] --> (0.345 0.250)	[0 1 1 0] --> (0.331 0.566)
			[1 1 1] --> (0.510 0.490)	[0 1 1 1] --> (0.328 0.309)
				[1 0 0 0] --> (0.183 0.267)
				[1 0 0 1] --> (0.218 0.149)
				[1 0 1 0] --> (0.180 0.010)
				[1 0 1 1] --> (0.290 0.170)
				[1 1 0 0] --> (0.403 0.587)
				[1 1 0 1] --> (0.438 0.469)
				[1 1 1 0] --> (0.400 0.330)
				[1 1 1 1] --> (0.510 0.490)

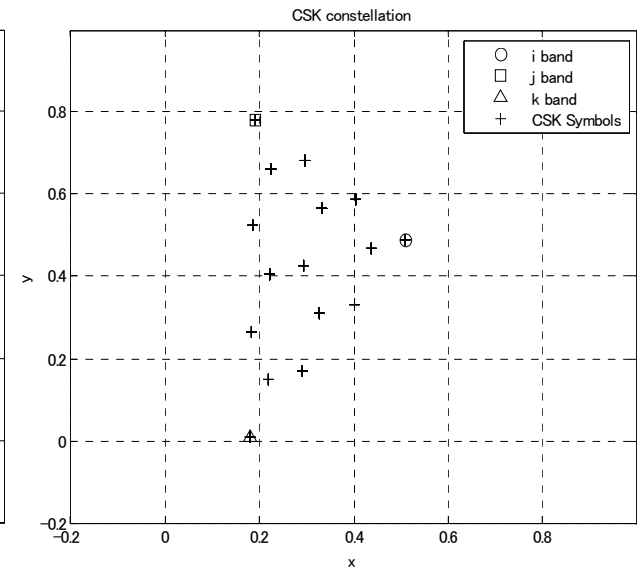
# Constellations for (001-010-000)



**4CSK**



**8CSK**



**16CSK**