

CHSH polytope V representation

August 21, 2024

We use j as a label for the vertices—extremal points—of the convex polytope of the Bell scenario with two parties, each having two dichotomic measurement settings. There are 16 deterministic vertices that are also extremal points of the local polytope and 8 non-deterministic PR-boxes that are outside the local polytope.

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	1	0	0	0
$\{A_1, B_2\}$	1	0	0	0
$\{A_2, B_1\}$	1	0	0	0
$\{A_2, B_2\}$	1	0	0	0

Table 1: $j = 1$

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	0	1	0	0
$\{A_1, B_2\}$	0	1	0	0
$\{A_2, B_1\}$	0	1	0	0
$\{A_2, B_2\}$	0	1	0	0

Table 2: $j = 2$

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	0	0	1	0
$\{A_1, B_2\}$	0	0	1	0
$\{A_2, B_1\}$	0	0	1	0
$\{A_2, B_2\}$	0	0	1	0

Table 3: $j = 3$

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	0	0	0	1
$\{A_1, B_2\}$	0	0	0	1
$\{A_2, B_1\}$	0	0	0	1
$\{A_2, B_2\}$	0	0	0	1

Table 4: $j = 4$

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	0	1	0	0
$\{A_1, B_2\}$	1	0	0	0
$\{A_2, B_1\}$	0	1	0	0
$\{A_2, B_2\}$	1	0	0	0

Table 5: $j = 5$

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	1	0	0	0
$\{A_1, B_2\}$	1	0	0	0
$\{A_2, B_1\}$	0	0	1	0
$\{A_2, B_2\}$	0	0	1	0

Table 6: $j = 6$

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	0	1	0	0
$\{A_1, B_2\}$	0	1	0	0
$\{A_2, B_1\}$	0	0	0	1
$\{A_2, B_2\}$	0	0	0	1

Table 7: $j = 7$

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	0	0	1	0
$\{A_1, B_2\}$	0	0	1	0
$\{A_2, B_1\}$	1	0	0	0
$\{A_2, B_2\}$	1	0	0	0

Table 8: $j = 8$

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	0	0	0	1
$\{A_1, B_2\}$	0	0	0	1
$\{A_2, B_1\}$	0	1	0	0
$\{A_2, B_2\}$	0	1	0	0

Table 9: $j = 9$

	(0,0)	(0,1)	(1,0)	(1,1)
$\{A_1, B_1\}$	1	0	0	0
$\{A_1, B_2\}$	0	1	0	0
$\{A_2, B_1\}$	1	0	0	0
$\{A_2, B_2\}$	0	1	0	0

Table 10: $j = 10$

	(0,0)	(0,1)	(1,0)	(1,1)
$\{A_1, B_1\}$	0	0	0	1
$\{A_1, B_2\}$	0	0	1	0
$\{A_2, B_1\}$	0	0	0	1
$\{A_2, B_2\}$	0	0	1	0

Table 11: $j = 11$

	(0,0)	(0,1)	(1,0)	(1,1)
$\{A_1, B_1\}$	0	1	0	0
$\{A_1, B_2\}$	1	0	0	0
$\{A_2, B_1\}$	0	0	0	1
$\{A_2, B_2\}$	0	0	1	0

Table 12: $j = 12$

	(0,0)	(0,1)	(1,0)	(1,1)
$\{A_1, B_1\}$	0	0	1	0
$\{A_1, B_2\}$	0	0	0	1
$\{A_2, B_1\}$	1	0	0	0
$\{A_2, B_2\}$	0	1	0	0

Table 13: $j = 13$

	(0,0)	(0,1)	(1,0)	(1,1)
$\{A_1, B_1\}$	0	0	1	0
$\{A_1, B_2\}$	0	0	0	1
$\{A_2, B_1\}$	0	0	1	0
$\{A_2, B_2\}$	0	0	0	1

Table 14: $j = 14$

	(0,0)	(0,1)	(1,0)	(1,1)
$\{A_1, B_1\}$	1	0	0	0
$\{A_1, B_2\}$	0	1	0	0
$\{A_2, B_1\}$	0	0	1	0
$\{A_2, B_2\}$	0	0	0	1

Table 15: $j = 15$

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	0	0	0	1
$\{A_1, B_2\}$	0	0	1	0
$\{A_2, B_1\}$	0	1	0	0
$\{A_2, B_2\}$	1	0	0	0

Table 16: $j = 16$

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	$\frac{1}{2}$	0	0	$\frac{1}{2}$
$\{A_1, B_2\}$	$\frac{1}{2}$	0	0	$\frac{1}{2}$
$\{A_2, B_1\}$	$\frac{1}{2}$	0	0	$\frac{1}{2}$
$\{A_2, B_2\}$	0	$\frac{1}{2}$	$\frac{1}{2}$	0

Table 17: $j = 17$

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	0	$\frac{1}{2}$	$\frac{1}{2}$	0
$\{A_1, B_2\}$	0	$\frac{1}{2}$	$\frac{1}{2}$	0
$\{A_2, B_1\}$	0	$\frac{1}{2}$	$\frac{1}{2}$	0
$\{A_2, B_2\}$	$\frac{1}{2}$	0	0	$\frac{1}{2}$

Table 18: $j = 18$

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	$\frac{1}{2}$	0	0	$\frac{1}{2}$
$\{A_1, B_2\}$	0	$\frac{1}{2}$	$\frac{1}{2}$	0
$\{A_2, B_1\}$	$\frac{1}{2}$	0	0	$\frac{1}{2}$
$\{A_2, B_2\}$	$\frac{1}{2}$	0	0	$\frac{1}{2}$

Table 19: $j = 19$

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	0	$\frac{1}{2}$	$\frac{1}{2}$	0
$\{A_1, B_2\}$	$\frac{1}{2}$	0	0	$\frac{1}{2}$
$\{A_2, B_1\}$	0	$\frac{1}{2}$	$\frac{1}{2}$	0
$\{A_2, B_2\}$	0	$\frac{1}{2}$	$\frac{1}{2}$	0

Table 20: $j = 20$

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	$\frac{1}{2}$	0	0	$\frac{1}{2}$
$\{A_1, B_2\}$	$\frac{1}{2}$	0	0	$\frac{1}{2}$
$\{A_2, B_1\}$	0	$\frac{1}{2}$	$\frac{1}{2}$	0
$\{A_2, B_2\}$	$\frac{1}{2}$	0	0	$\frac{1}{2}$

Table 21: $j = 21$

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	0	$\frac{1}{2}$	$\frac{1}{2}$	0
$\{A_1, B_2\}$	0	$\frac{1}{2}$	$\frac{1}{2}$	0
$\{A_2, B_1\}$	$\frac{1}{2}$	0	0	$\frac{1}{2}$
$\{A_2, B_2\}$	0	$\frac{1}{2}$	$\frac{1}{2}$	0

Table 22: $j = 22$

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	$\frac{1}{2}$	0	0	$\frac{1}{2}$
$\{A_1, B_2\}$	0	$\frac{1}{2}$	$\frac{1}{2}$	0
$\{A_2, B_1\}$	0	$\frac{1}{2}$	$\frac{1}{2}$	0
$\{A_2, B_2\}$	0	$\frac{1}{2}$	$\frac{1}{2}$	0

Table 23: $j = 23$

	(0, 0)	(0, 1)	(1, 0)	(1, 1)
$\{A_1, B_1\}$	0	$\frac{1}{2}$	$\frac{1}{2}$	0
$\{A_1, B_2\}$	$\frac{1}{2}$	0	0	$\frac{1}{2}$
$\{A_2, B_1\}$	$\frac{1}{2}$	0	0	$\frac{1}{2}$
$\{A_2, B_2\}$	$\frac{1}{2}$	0	0	$\frac{1}{2}$

Table 24: $j = 24$