

**PREHOMOGENEOUS SPACES ASSOCIATED WITH NILPOTENT  
ORBITS IN TYPE EII**

STEVEN GLENN JACKSON AND ALFRED G. NOËL

<b>Nilpotent orbits in type EII</b>				
Orbit	$K_{\mathbb{C}}$ diagram	$i$	$\dim \mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Highest weights of $\mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$
1.	$\begin{array}{ccccccc} \circ & - & \circ & - & \circ & - & \circ \\ 0 & 0 & 1 & 0 & 0 & 0 & 1 \end{array}$	1	10	(0, 1, -1, 1, 0, 1) (0, 0, 1, 0, 0, -1)
		2	1	(0, 0, 1, 0, 0, 1)
2.	$\begin{array}{ccccccc} \circ & - & \circ & - & \circ & - & \circ \\ 1 & 0 & 0 & 0 & 1 & 0 & 2 \end{array}$	1	8	(0, 1, 0, 0, -1, 1) (-1, 0, 0, 1, 0, 1)
		2	6	(0, 0, 1, 0, 0, 1)
3.	$\begin{array}{ccccccc} \circ & - & \circ & - & \circ & - & \circ \\ 0 & 1 & 0 & 1 & 0 & 0 & 0 \end{array}$	1	8	(0, 1, 0, -1, 1, 1) (1, -1, 0, 1, 0, 1)
		2	4	(0, 0, 1, 0, 0, 1)
4.	$\begin{array}{ccccccc} \circ & - & \circ & - & \circ & - & \circ \\ 0 & 0 & 1 & 0 & 0 & 0 & 3 \end{array}$	1	9	(1, 0, -1, 0, 1, 1)
		2	9	(0, 1, -1, 1, 0, 1)
		3	1	(0, 0, 1, 0, 0, 1)
5.	$\begin{array}{ccccccc} \circ & - & \circ & - & \circ & - & \circ \\ 1 & 0 & 1 & 0 & 1 & 0 & 1 \end{array}$	1	9	(1, 0, -1, 0, 1, 1) (0, 1, 0, 0, -1, 1) (-1, 0, 0, 1, 0, 1) (0, 1, -1, 1, 0, -1)
		2	5	(0, 1, -1, 1, 0, 1) (0, 0, 1, 0, 0, -1)
		3	1	(0, 0, 1, 0, 0, 1)
6.	$\begin{array}{ccccccc} \circ & - & \circ & - & \circ & - & \circ \\ 0 & 0 & 0 & 0 & 0 & 0 & 4 \end{array}$	2	20	(0, 0, 1, 0, 0, 1)
7.	$\begin{array}{ccccccc} \circ & - & \circ & - & \circ & - & \circ \\ 2 & 0 & 0 & 0 & 2 & 0 & 0 \end{array}$	2	12	(0, 0, 1, 0, 0, 1)
8.	$\begin{array}{ccccccc} \circ & - & \circ & - & \circ & - & \circ \\ 0 & 0 & 2 & 0 & 0 & 0 & 2 \end{array}$	2	10	(0, 1, -1, 1, 0, 1) (0, 0, 1, 0, 0, -1)
		4	1	(0, 0, 1, 0, 0, 1)
9.	$\begin{array}{ccccccc} \circ & - & \circ & - & \circ & - & \circ \\ 2 & 1 & 0 & 0 & 1 & 1 & 0 \end{array}$	1	7	(1, -1, 1, 0, -1, 1) (1, -1, 0, 1, 0, -1) (0, 1, 0, 0, -1, -1)
		2	7	(0, 1, 0, 0, -1, 1) (1, -1, 0, 1, 0, 1) (0, 0, 1, 0, 0, -1)
		3	3	(0, 0, 1, 0, 0, 1)
10.	$\begin{array}{ccccccc} \circ & - & \circ & - & \circ & - & \circ \\ 1 & 0 & 0 & 1 & 2 & 1 & 0 \end{array}$	1	7	(-1, 0, 1, -1, 1, 1) (0, 1, 0, -1, 1, -1) (-1, 0, 0, 1, 0, -1)

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Nilpotent orbits in type EII (continued)				
Orbit	$K_{\mathbb{C}}$ diagram	$i$	$\dim \mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Highest weights of $\mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$
11.	$\begin{array}{ccccccc} \circ & \circ & \circ & \circ & \circ & \circ \\ 0 & 2 & 0 & 2 & 0 & 0 \end{array}$	2	7	(−1, 0, 0, 1, 0, 1) (0, 1, 0, −1, 1, 1) (0, 0, 1, 0, 0, −1)
		3	3	(0, 0, 1, 0, 0, 1)
12.	$\begin{array}{ccccccc} \circ & \circ & \circ & \circ & \circ & \circ \\ 3 & 0 & 1 & 0 & 0 & 0 \end{array}$	2	8	(0, 1, 0, −1, 1, 1) (1, −1, 0, 1, 0, 1)
		4	4	(0, 0, 1, 0, 0, 1)
13.	$\begin{array}{ccccccc} \circ & \circ & \circ & \circ & \circ & \circ \\ 0 & 0 & 1 & 0 & 3 & 0 \end{array}$	1	6	(1, 0, −1, 0, 1, 1)
		2	12	(0, 1, −1, 1, 0, 1)
		3	2	(0, 0, 1, 0, 0, 1)
14.	$\begin{array}{ccccccc} \circ & \circ & \circ & \circ & \circ & \circ \\ 1 & 1 & 0 & 1 & 1 & 2 \end{array}$	1	6	(1, −1, 1, 0, −1, 1) (−1, 0, 1, −1, 1, 1) (1, −1, 0, 1, 0, −1) (0, 1, 0, −1, 1, −1)
		2	6	(0, 1, 0, 0, −1, 1) (1, −1, 1, −1, 1, 1) (−1, 0, 0, 1, 0, 1) (0, 0, 1, 0, 0, −1)
		3	2	(0, 1, 0, −1, 1, 1) (1, −1, 0, 1, 0, 1)
		4	2	(0, 0, 1, 0, 0, 1)
		1	4	(1, 0, −1, 1, −1, 1) (−1, 1, −1, 0, 1, 1)
15.	$\begin{array}{ccccccc} \circ & \circ & \circ & \circ & \circ & \circ \\ 1 & 0 & 2 & 0 & 1 & 4 \end{array}$	2	3	(−1, 0, 1, 0, −1, 1) (1, 0, −1, 0, 1, 1) (0, 0, 1, 0, 0, −1)
		3	4	(0, 1, 0, 0, −1, 1) (−1, 0, 0, 1, 0, 1)
		4	4	(0, 1, −1, 1, 0, 1)
		6	1	(0, 0, 1, 0, 0, 1)
		1	4	(1, −1, 0, 1, 0, −1) (0, 1, 0, −1, 1, −1)
16.	$\begin{array}{ccccccc} \circ & \circ & \circ & \circ & \circ & \circ \\ 0 & 1 & 2 & 1 & 0 & 2 \end{array}$	2	5	(1, −1, 1, −1, 1, 1) (0, 1, −1, 1, 0, −1)
		3	4	(0, 1, 0, −1, 1, 1) (1, −1, 0, 1, 0, 1)
		4	2	(0, 1, −1, 1, 0, 1) (0, 0, 1, 0, 0, −1)
		6	1	(0, 0, 1, 0, 0, 1)
		1	6	(1, −1, 1, 0, −1, 1) (1, 0, −1, 0, 1, 1) (−1, 0, 1, −1, 1, 1) (−1, 0, 0, 1, 0, −1) (1, −1, 1, −1, 1, −1) (0, 1, 0, 0, −1, −1)
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Nilpotent orbits in type EII (continued)				
Orbit	$K_{\mathbb{C}}$ diagram	$i$	$\dim \mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Highest weights of $\mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$
18.	$\begin{array}{ccccccc} \circ & \circ & \circ & \circ & \circ & \circ \\ 1 & 0 & 3 & 0 & 1 & 1 \end{array}$	2	5	(0, 1, 0, 0, -1, 1) (1, -1, 1, -1, 1, 1) (-1, 0, 0, 1, 0, 1) (1, -1, 0, 1, 0, -1) (0, 1, 0, -1, 1, -1)
		3	3	(0, 1, 0, -1, 1, 1) (1, -1, 0, 1, 0, 1) (0, 1, -1, 1, 0, -1)
		4	2	(0, 1, -1, 1, 0, 1) (0, 0, 1, 0, 0, -1)
		5	1	(0, 0, 1, 0, 0, 1)
19.	$\begin{array}{ccccccc} \circ & \circ & \circ & \circ & \circ & \circ \\ 1 & 1 & 1 & 1 & 1 & 3 \end{array}$	1	5	(-1, 0, 1, 0, -1, 1) (-1, 0, 0, 1, 0, -1) (0, 1, 0, 0, -1, -1)
		2	8	(0, 1, 0, 0, -1, 1) (-1, 0, 0, 1, 0, 1) (0, 1, -1, 1, 0, -1)
		3	4	(0, 1, -1, 1, 0, 1)
		5	1	(0, 0, 1, 0, 0, -1)
		6	1	(0, 0, 1, 0, 0, 1)
		1	5	(1, 0, -1, 1, -1, 1) (-1, 0, 1, 0, -1, 1) (-1, 1, -1, 0, 1, 1) (1, -1, 0, 1, 0, -1) (0, 1, 0, -1, 1, -1)
20.	$\begin{array}{ccccccc} \circ & \circ & \circ & \circ & \circ & \circ \\ 0 & 0 & 4 & 0 & 0 & 0 \end{array}$	2	18	(0, 1, -1, 1, 0, 1)
		6	2	(0, 0, 1, 0, 0, 1)
		2	10	(1, -1, 1, -1, 1, 1) (0, 0, 1, 0, 0, -1)
		4	4	(0, 1, 0, -1, 1, 1) (1, -1, 0, 1, 0, 1)
		6	2	(0, 0, 1, 0, 0, 1)
		2	9	(1, 0, -1, 0, 1, 1) (0, 1, 0, 0, -1, 1) (-1, 0, 0, 1, 0, 1) (0, 1, -1, 1, 0, -1)
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Nilpotent orbits in type EII (continued)				
Orbit	$K_{\mathbb{C}}$ diagram	$i$	$\dim \mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Highest weights of $\mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$
23.	$\begin{array}{ccccccc} \circ & \circ & \circ & \circ & \circ & \circ \\ 0 & 0 & 4 & 0 & 0 & 8 \end{array}$	4	5	(0, 1, -1, 1, 0, 1) (0, 0, 1, 0, 0, -1)
		6	1	(0, 0, 1, 0, 0, 1)
		2	10	(1, 0, -1, 0, 1, 1) (0, 0, 1, 0, 0, -1)
24.	$\begin{array}{ccccccc} \circ & \circ & \circ & \circ & \circ & \circ \\ 2 & 0 & 4 & 0 & 2 & 4 \end{array}$	6	9	(0, 1, -1, 1, 0, 1)
		10	1	(0, 0, 1, 0, 0, 1)
		2	6	(-1, 0, 1, 0, -1, 1) (1, 0, -1, 0, 1, 1) (0, 1, -1, 1, 0, -1)
		4	4	(0, 1, 0, 0, -1, 1) (-1, 0, 0, 1, 0, 1)
25.	$\begin{array}{ccccccc} \circ & \circ & \circ & \circ & \circ & \circ \\ 4 & 0 & 0 & 0 & 4 & 4 \end{array}$	6	5	(0, 1, -1, 1, 0, 1) (0, 0, 1, 0, 0, -1)
		2	14	(0, 1, 0, 0, -1, 1) (-1, 0, 0, 1, 0, 1) (0, 0, 1, 0, 0, -1)
		6	6	(0, 0, 1, 0, 0, 1)
26.	$\begin{array}{ccccccc} \circ & \circ & \circ & \circ & \circ & \circ \\ 2 & 2 & 0 & 2 & 2 & 0 \end{array}$	2	8	(0, 1, 0, 0, -1, 1) (1, -1, 1, -1, 1, 1) (-1, 0, 0, 1, 0, 1)
		4	4	(0, 1, 0, -1, 1, 1) (1, -1, 0, 1, 0, 1)
		6	4	(0, 0, 1, 0, 0, 1)
27.	$\begin{array}{ccccccc} \circ & \circ & \circ & \circ & \circ & \circ \\ 1 & 2 & 1 & 1 & 3 & 1 \end{array}$	1	4	(-1, 1, -1, 0, 1, 1) (0, 1, 0, 0, -1, -1) (-1, 0, 1, -1, 1, -1) (1, 0, -1, 0, 1, -1)
		2	5	(1, 0, -1, 0, 1, 1) (-1, 0, 1, -1, 1, 1) (0, 1, 0, 0, -1, 1) (-1, 0, 0, 1, 0, -1) (1, -1, 1, -1, 1, -1)
		3	3	(1, -1, 1, -1, 1, 1) (-1, 0, 0, 1, 0, 1) (1, -1, 0, 1, 0, -1)
		4	2	(1, -1, 0, 1, 0, 1) (0, 1, 0, -1, 1, -1)
		5	2	(0, 1, 0, -1, 1, 1) (0, 1, -1, 1, 0, -1)
		6	2	(0, 1, -1, 1, 0, 1) (0, 0, 1, 0, 0, -1)
		7	1	(0, 0, 1, 0, 0, 1)
28.	$\begin{array}{ccccccc} \circ & \circ & \circ & \circ & \circ & \circ \\ 3 & 1 & 1 & 2 & 1 & 1 \end{array}$	1	4	(1, 0, -1, 1, -1, 1) (-1, 0, 0, 1, 0, -1) (1, 0, -1, 0, 1, -1) (1, -1, 1, 0, -1, -1)

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Nilpotent orbits in type EII (continued)				
Orbit	$K_{\mathbb{C}}$ diagram	$i$	$\dim \mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Highest weights of $\mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$
		2	5	(1, -1, 1, 0, -1, 1) (1, 0, -1, 0, 1, 1) (-1, 0, 0, 1, 0, 1) (1, -1, 1, -1, 1, -1) (0, 1, 0, 0, -1, -1)
				(0, 1, 0, 0, -1, 1) (1, -1, 1, -1, 1, 1) (0, 1, 0, -1, 1, -1)
				(0, 1, 0, -1, 1, 1) (1, -1, 0, 1, 0, -1)
				(1, -1, 0, 1, 0, 1) (0, 1, -1, 1, 0, -1)
				(0, 1, -1, 1, 0, 1) (0, 0, 1, 0, 0, -1)
		6	2	(0, 0, 1, 0, 0, 1)
		7	1	(0, 0, 1, 0, 0, 1)
29.	 $\begin{matrix} & \circ & \circ & \circ & \circ & \circ & \circ \\ & 3 & 1 & 3 & 1 & 0 & 4 \end{matrix}$	1	3	(1, 0, 0, -1, 0, 1) (1, -1, 1, -1, 1, -1)  (1, 0, -1, 0, 1, 1) (-1, 0, 1, -1, 1, 1) (1, -1, 0, 1, 0, -1) (0, 1, 0, -1, 1, -1)  (-1, 0, 0, 1, 0, 1) (0, 1, -1, 1, 0, -1)
				(1, -1, 1, -1, 1, 1) (0, 1, 0, -1, 1, -1)
				(1, -1, 1, -1, 1, 1) (0, 1, 0, -1, 1, -1)
				(0, 1, 0, -1, 1, 1) (1, -1, 0, 1, 0, 1) (0, 0, 1, 0, 0, -1)
				(0, 1, -1, 1, 0, 1) (0, 0, 1, 0, 0, -1)
				(0, 1, -1, 1, 0, 1)
				(0, 0, 1, 0, 0, 1)
		10	1	(0, 0, 1, 0, 0, 1)
		30.	 $\begin{matrix} & \circ & \circ & \circ & \circ & \circ & \circ \\ & 0 & 1 & 3 & 1 & 3 & 4 \end{matrix}$	(0, -1, 0, 0, 1, 1) (1, -1, 1, -1, 1, -1)  (1, -1, 1, 0, -1, 1) (1, 0, -1, 0, 1, 1) (1, -1, 0, 1, 0, -1) (0, 1, 0, -1, 1, -1)  (0, 1, 0, 0, -1, 1) (0, 1, -1, 1, 0, -1)
				(1, -1, 1, -1, 1, 1) (0, 1, 0, -1, 1, 1) (1, -1, 0, 1, 0, 1) (0, 0, 1, 0, 0, -1)
				(0, 1, -1, 1, 0, 1) (0, 0, 1, 0, 0, -1)
				(0, 0, 1, 0, 0, 1)
				(1, 0, -1, 1, -1, 1) (-1, 0, 1, 0, -1, 1) (-1, 1, -1, 0, 1, 1)
				(1, 0, -1, 1, -1, 1) (-1, 0, 1, 0, -1, 1) (-1, 1, -1, 0, 1, 1)
				(1, 0, -1, 1, -1, 1) (-1, 0, 1, 0, -1, 1) (-1, 1, -1, 0, 1, 1)
31.	 $\begin{matrix} & \circ & \circ & \circ & \circ & \circ & \circ \\ & 1 & 3 & 1 & 3 & 1 & 3 \end{matrix}$	1	3	(1, 0, -1, 1, -1, 1) (-1, 0, 1, 0, -1, 1) (-1, 1, -1, 0, 1, 1)

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Nilpotent orbits in type EII (continued)				
Orbit	$K_{\mathbb{C}}$ diagram	$i$	$\dim \mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Highest weights of $\mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$
32.		2	5	(1, -1, 1, 0, -1, 1) (1, 0, -1, 0, 1, 1) (-1, 0, 1, -1, 1, 1) (-1, 0, 0, 1, 0, -1) (0, 1, 0, 0, -1, -1)
				(1, -1, 1, -1, 1, 1) (1, -1, 0, 1, 0, -1) (0, 1, 0, -1, 1, -1)
				(0, 1, 0, 0, -1, 1) (-1, 0, 0, 1, 0, 1)
				(0, 1, 0, -1, 1, 1) (1, -1, 0, 1, 0, 1) (0, 1, -1, 1, 0, -1)
				(0, 0, 1, 0, 0, -1)
				(0, 1, -1, 1, 0, 1)
		4	6	(0, 0, 1, 0, 0, 1)
				(1, -1, 1, 0, -1, 1) (1, 0, -1, 0, 1, 1) (-1, 0, 1, -1, 1, 1) (-1, 0, 0, 1, 0, -1) (1, -1, 1, -1, 1, -1) (0, 1, 0, 0, -1, -1)
				(0, 1, 0, 0, -1, 1) (1, -1, 1, -1, 1, 1) (-1, 0, 0, 1, 0, 1) (1, -1, 0, 1, 0, -1) (0, 1, 0, -1, 1, -1)
				(0, 1, 0, -1, 1, 1) (1, -1, 0, 1, 0, 1) (0, 1, -1, 1, 0, -1)
33.		2	12	(1, -1, 1, -1, 1, 1) (1, -1, 0, 1, 0, -1) (0, 1, 0, -1, 1, -1)
				(0, 1, 0, -1, 1, 1) (1, -1, 0, 1, 0, 1) (0, 0, 1, 0, 0, -1)
				(0, 0, 1, 0, 0, 1)
		10	2	(1, -1, 1, -1, 1, 1) (1, -1, 0, 1, 0, -1) (0, 1, 0, -1, 1, -1)
34.		2	5	(-1, 0, 1, 0, -1, 1) (1, 0, -1, 0, 1, 1) (-1, 0, 0, 1, 0, -1) (1, -1, 1, -1, 1, -1) (0, 1, 0, 0, -1, -1)
				(1, -1, 1, 0, -1, 1) (-1, 0, 1, -1, 1, 1) (1, -1, 0, 1, 0, -1) (0, 1, 0, -1, 1, -1)
		4	4	(1, -1, 1, 0, -1, 1) (-1, 0, 1, -1, 1, 1) (1, -1, 0, 1, 0, -1) (0, 1, 0, -1, 1, -1)
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Nilpotent orbits in type EII (continued)				
Orbit	$K_{\mathbb{C}}$ diagram	$i$	$\dim \mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Highest weights of $\mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$
35.		6	4	(0, 1, 0, 0, -1, 1) (1, -1, 1, -1, 1, 1) (-1, 0, 0, 1, 0, 1) (0, 1, -1, 1, 0, -1)
		8	2	(0, 1, 0, -1, 1, 1) (1, -1, 0, 1, 0, 1)
		10	2	(0, 1, -1, 1, 0, 1) (0, 0, 1, 0, 0, -1)
		14	1	(0, 0, 1, 0, 0, 1)
36.		2	9	(1, 0, -1, 1, -1, 1) (-1, 0, 1, 0, -1, 1) (-1, 1, -1, 0, 1, 1) (0, 1, -1, 1, 0, -1)
		6	6	(1, 0, -1, 0, 1, 1) (0, 1, 0, 0, -1, 1) (-1, 0, 0, 1, 0, 1) (0, 0, 1, 0, 0, -1)
		10	4	(0, 1, -1, 1, 0, 1)
		14	1	(0, 0, 1, 0, 0, 1)
37.		2	8	(1, -1, 1, 0, -1, 1) (-1, 0, 1, -1, 1, 1) (-1, 0, 0, 1, 0, -1) (1, -1, 1, -1, 1, -1) (0, 1, 0, 0, -1, -1)
		6	6	(0, 1, 0, 0, -1, 1) (1, -1, 1, -1, 1, 1) (-1, 0, 0, 1, 0, 1) (1, -1, 0, 1, 0, -1) (0, 1, 0, -1, 1, -1)
		10	4	(0, 1, 0, -1, 1, 1) (1, -1, 0, 1, 0, 1) (0, 0, 1, 0, 0, -1)
		14	2	(0, 0, 1, 0, 0, 1)
37.		2	6	(1, 0, -1, 1, -1, 1) (-1, 0, 1, 0, -1, 1) (-1, 1, -1, 0, 1, 1) (-1, 0, 0, 1, 0, -1) (1, -1, 1, -1, 1, -1) (0, 1, 0, 0, -1, -1)
		6	5	(1, -1, 1, 0, -1, 1) (1, 0, -1, 0, 1, 1) (-1, 0, 1, -1, 1, 1) (1, -1, 0, 1, 0, -1) (0, 1, 0, -1, 1, -1)
		10	4	(0, 1, 0, 0, -1, 1) (1, -1, 1, -1, 1, 1) (-1, 0, 0, 1, 0, 1) (0, 1, -1, 1, 0, -1)
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Nilpotent orbits in type EII (continued)				
Orbit	$K_{\mathbb{C}}$ diagram	$i$	$\dim \mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Highest weights of $\mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$
		14	3	(0, 1, 0, -1, 1, 1) (1, -1, 0, 1, 0, 1) (0, 0, 1, 0, 0, -1)
		18	1	(0, 1, -1, 1, 0, 1)
		22	1	(0, 0, 1, 0, 0, 1)

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