

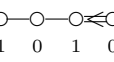
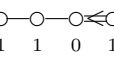
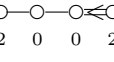
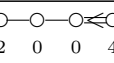
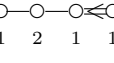
PREHOMOGENEOUS SPACES ASSOCIATED WITH NILPOTENT ORBITS IN TYPE EI

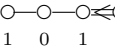
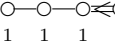
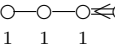
STEVEN GLENN JACKSON AND ALFRED G. NOËL

Nilpotent orbits in type EI					
Orbit	$K_{\mathbb{C}}$ diagram	i	$\dim \mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Highest weights of $\mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Prehomogeneous space
1.		1	10	$(0, 0, 2, -1)$	$S^2(\mathrm{SL}_4)$
		2	1	$(0, 0, 0, 1)$	$\mathbb{C}$
2.		1	8	$(1, -1, 1, 0)$	$\mathrm{SL}_2 \otimes \mathrm{Sp}_4$
		2	5	$(0, 0, 0, 1)$	SO_5
3.		1	9	$(-1, 0, 1, 0)$ $(0, 2, 0, -1)$	$\mathrm{SL}_3^* \otimes S^2(\mathrm{SL}_3)$
		2	6	$(0, 0, 2, -1)$	$S^2(\mathrm{SL}_3^*)$
		3	1	$(0, 0, 0, 1)$	$\mathbb{C}$
4.		2	10	$(0, 0, 2, -1)$	$S^2(\mathrm{SL}_4)$
		4	1	$(0, 0, 0, 1)$	$\mathbb{C}$
5.		2	14	$(0, 0, 0, 1)$	$\wedge^3(\mathrm{Sp}_6)/\mathrm{Sp}_6$
6.		2	8	$(1, -1, 1, 0)$	$\mathrm{SL}_2 \otimes \mathrm{Sp}_4$
		4	5	$(0, 0, 0, 1)$	SO_5
7.		1	4	$(1, 0, 1, -1)$	$\mathrm{SL}_2^1 \otimes \mathrm{SL}_2^2$
		2	4	$(0, 2, 0, -1)$ $(2, -2, 0, 1)$	$\mathbb{C} \oplus S^2(\mathrm{SL}_2^1)$
		3	4	$(1, -1, 1, 0)$	$\mathrm{SL}_2^1 \otimes \mathrm{SL}_2^2$
		4	3	$(0, 0, 2, -1)$	$S^2(\mathrm{SL}_2^2)$
		6	1	$(0, 0, 0, 1)$	$\mathbb{C}$
8.		1	7	$(1, 0, 1, -1)$ $(2, -2, 0, 1)$	$(\mathrm{SL}_2^1 \otimes \mathrm{SL}_2^2) \oplus S^2(\mathrm{SL}_2^1)$
		2	5	$(1, -1, 1, 0)$ $(0, 2, 0, -1)$	$(\mathrm{SL}_2^1 \otimes \mathrm{SL}_2^2) \oplus \mathbb{C}$
		3	3	$(0, 0, 2, -1)$	$S^2(\mathrm{SL}_2^2)$
		4	1	$(0, 0, 0, 1)$	$\mathbb{C}$
9.		2	7	$(1, 0, 1, -1)$ $(2, -2, 0, 1)$	$(\mathrm{SL}_2^1 \otimes \mathrm{SL}_2^2) \oplus S^2(\mathrm{SL}_2^1)$
<i>(continued on next page)</i>					

2000 *Mathematics Subject Classification.* 17B05;17B10;17B20;22E30.

Key words and phrases. Lie group, nilpotent orbit, prehomogeneous space.

Nilpotent orbits in type EI (continued)					
Orbit	$K_{\mathbb{C}}$ diagram	i	$\dim \mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Highest weights of $\mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Prehomogeneous space
		4	5	$(1, -1, 1, 0)$ $(0, 2, 0, -1)$	$(\mathrm{SL}_2^1 \otimes \mathrm{SL}_2^2) \oplus \mathbb{C}$
		6	3	$(0, 0, 2, -1)$	$\mathrm{S}^2(\mathrm{SL}_2^2)$
		8	1	$(0, 0, 0, 1)$	$\mathbb{C}$
10.		1	6	$(-1, 1, -1, 1)$ $(1, 1, -1, 0)$	$(\mathrm{SL}_2^1 \otimes \mathrm{SL}_2^2) \oplus \mathrm{SL}_2^1$
		2	7	$(-1, 0, 1, 0)$ $(0, 2, -2, 1)$	$\mathbb{C} \oplus (\mathrm{S}^2(\mathrm{SL}_2^1) \otimes \mathrm{SL}_2^2)$
		3	2	$(0, 1, 0, 0)$	SL_2^1
		4	2	$(0, 0, 0, 1)$	SL_2^2
11.		1	6	$(-1, 1, 1, -1)$ $(0, -1, 0, 1)$ $(2, -2, 2, -1)$	$\mathrm{SL}_2 \oplus \mathbb{C} \oplus \mathrm{S}^2(\mathrm{SL}_2)$
		2	5	$(-1, 0, 1, 0)$ $(1, 0, 1, -1)$ $(2, -2, 0, 1)$	$\mathrm{SL}_2 \oplus \mathrm{SL}_2 \oplus \mathbb{C}$
		3	3	$(1, -1, 1, 0)$ $(0, 2, 0, -1)$	$\mathrm{SL}_2 \oplus \mathbb{C}$
		4	3	$(0, 0, 2, -1)$	$\mathrm{S}^2(\mathrm{SL}_2)$
		5	1	$(0, 0, 0, 1)$	$\mathbb{C}$
12.		2	9	$(-1, 0, 1, 0)$ $(0, 2, 0, -1)$	$\mathrm{SL}_3^* \oplus \mathrm{S}^2(\mathrm{SL}_3)$
		4	6	$(0, 0, 2, -1)$	$\mathrm{S}^2(\mathrm{SL}_3^*)$
		6	1	$(0, 0, 0, 1)$	$\mathbb{C}$
13.		2	7	$(-2, 0, 0, 1)$ $(0, 2, 0, -1)$	$\mathbb{C} \oplus \mathrm{S}^2(\mathrm{SL}_3)$
		4	3	$(-1, 0, 1, 0)$	SL_3^*
		6	6	$(0, 0, 2, -1)$	$\mathrm{S}^2(\mathrm{SL}_3^*)$
		10	1	$(0, 0, 0, 1)$	$\mathbb{C}$
14.		1	3	$(0, -1, 2, -1)$ $(-2, 0, 0, 1)$ $(2, -1, 0, 0)$	$\mathbb{C} \oplus \mathbb{C} \oplus \mathbb{C}$
		2	3	$(-1, 2, -1, 0)$ $(0, -1, 0, 1)$ $(2, -2, 2, -1)$	$\mathbb{C} \oplus \mathbb{C} \oplus \mathbb{C}$
		3	3	$(-1, 1, 1, -1)$ $(2, -2, 0, 1)$ $(1, 1, -1, 0)$	$\mathbb{C} \oplus \mathbb{C} \oplus \mathbb{C}$
		4	2	$(-1, 1, -1, 1)$ $(1, 0, 1, -1)$	$\mathbb{C} \oplus \mathbb{C}$
		5	2	$(-1, 0, 1, 0)$ $(1, 0, -1, 1)$	$\mathbb{C} \oplus \mathbb{C}$
		6	2	$(1, -1, 1, 0)$ $(0, 2, 0, -1)$	$\mathbb{C} \oplus \mathbb{C}$
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Nilpotent orbits in type EI (continued)					
Orbit	$K_{\mathbb{C}}$ diagram	i	$\dim \mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Highest weights of $\mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Prehomogeneous space
		7	1	$(0, 2, -2, 1)$	$\mathbb{C}$
		8	1	$(0, 1, 0, 0)$	$\mathbb{C}$
		9	1	$(0, 0, 2, -1)$	$\mathbb{C}$
		10	1	$(0, 0, 0, 1)$	$\mathbb{C}$
15.		1	5	$(-1, 1, 1, -1)$ $(-2, 0, 0, 1)$ $(1, 1, -1, 0)$	$\mathrm{SL}_2 \oplus \mathbb{C} \oplus \mathrm{SL}_2$
		2	5	$(-1, 1, -1, 1)$ $(0, 2, 0, -1)$	$\mathrm{SL}_2 \oplus \mathrm{S}^2(\mathrm{SL}_2)$
		3	4	$(-1, 0, 1, 0)$ $(0, 2, -2, 1)$	$\mathbb{C} \oplus \mathrm{S}^2(\mathrm{SL}_2)$
		4	2	$(0, 1, 0, 0)$	SL_2
		5	1	$(0, 0, 2, -1)$	$\mathbb{C}$
		6	1	$(0, 0, 0, 1)$	$\mathbb{C}$
16.		1	4	$(-1, 2, -1, 0)$ $(0, -1, 2, -1)$ $(-2, 0, 0, 1)$ $(2, -1, 0, 0)$	$\mathbb{C} \oplus \mathbb{C}$ $\oplus \mathbb{C} \oplus \mathbb{C}$
		2	4	$(-1, 1, 1, -1)$ $(0, -1, 0, 1)$ $(1, 1, -1, 0)$ $(2, -2, 2, -1)$	$\mathbb{C} \oplus \mathbb{C}$ $\oplus \mathbb{C} \oplus \mathbb{C}$
		3	3	$(-1, 1, -1, 1)$ $(1, 0, 1, -1)$ $(2, -2, 0, 1)$	$\mathbb{C} \oplus \mathbb{C} \oplus \mathbb{C}$
		4	3	$(-1, 0, 1, 0)$ $(1, 0, -1, 1)$ $(0, 2, 0, -1)$	$\mathbb{C} \oplus \mathbb{C} \oplus \mathbb{C}$
		5	2	$(1, -1, 1, 0)$ $(0, 2, -2, 1)$	$\mathbb{C} \oplus \mathbb{C}$
		6	1	$(0, 1, 0, 0)$	$\mathbb{C}$
		7	1	$(0, 0, 2, -1)$	$\mathbb{C}$
		8	1	$(0, 0, 0, 1)$	$\mathbb{C}$
17.		1	3	$(-1, 2, -1, 0)$ $(0, -1, 2, -1)$ $(2, -1, 0, 0)$	$\mathbb{C} \oplus \mathbb{C} \oplus \mathbb{C}$
		2	4	$(-1, 1, 1, -1)$ $(-2, 0, 0, 1)$ $(1, 1, -1, 0)$ $(2, -2, 2, -1)$	$\mathbb{C} \oplus \mathbb{C}$ $\oplus \mathbb{C} \oplus \mathbb{C}$
		3	2	$(0, -1, 0, 1)$ $(1, 0, 1, -1)$	$\mathbb{C} \oplus \mathbb{C}$
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Nilpotent orbits in type EI (continued)					
Orbit	$K_{\mathbb{C}}$ diagram	i	$\dim \mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Highest weights of $\mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Prehomogeneous space
		4	3	$(-1, 1, -1, 1)$ $(0, 2, 0, -1)$ $(2, -2, 0, 1)$	$\mathbb{C} \oplus \mathbb{C} \oplus \mathbb{C}$
		5	2	$(-1, 0, 1, 0)$ $(1, 0, -1, 1)$	$\mathbb{C} \oplus \mathbb{C}$
		6	2	$(1, -1, 1, 0)$ $(0, 2, -2, 1)$	$\mathbb{C} \oplus \mathbb{C}$
		7	1	$(0, 1, 0, 0)$	$\mathbb{C}$
		8	1	$(0, 0, 2, -1)$	$\mathbb{C}$
		10	1	$(0, 0, 0, 1)$	$\mathbb{C}$
18.		2	4	$(-1, 2, -1, 0)$ $(0, -1, 2, -1)$ $(-2, 0, 0, 1)$ $(2, -1, 0, 0)$	$\mathbb{C} \oplus \mathbb{C}$ $\oplus \mathbb{C} \oplus \mathbb{C}$
		4	4	$(-1, 1, 1, -1)$ $(0, -1, 0, 1)$ $(1, 1, -1, 0)$ $(2, -2, 2, -1)$	$\mathbb{C} \oplus \mathbb{C}$ $\oplus \mathbb{C} \oplus \mathbb{C}$
		6	3	$(-1, 1, -1, 1)$ $(1, 0, 1, -1)$ $(2, -2, 0, 1)$	$\mathbb{C} \oplus \mathbb{C} \oplus \mathbb{C}$
		8	3	$(-1, 0, 1, 0)$ $(1, 0, -1, 1)$ $(0, 2, 0, -1)$	$\mathbb{C} \oplus \mathbb{C} \oplus \mathbb{C}$
		10	2	$(1, -1, 1, 0)$ $(0, 2, -2, 1)$	$\mathbb{C} \oplus \mathbb{C}$
		12	1	$(0, 1, 0, 0)$	$\mathbb{C}$
		14	1	$(0, 0, 2, -1)$	$\mathbb{C}$
		16	1	$(0, 0, 0, 1)$	$\mathbb{C}$
19.		2	6	$(-1, 1, 1, -1)$ $(0, -1, 0, 1)$ $(2, -2, 2, -1)$	$\mathrm{SL}_2 \oplus \mathbb{C}$ $\oplus \mathrm{S}^2(\mathrm{SL}_2)$
		4	5	$(-1, 0, 1, 0)$ $(1, 0, 1, -1)$ $(2, -2, 0, 1)$	$\mathrm{SL}_2 \oplus \mathrm{SL}_2 \oplus \mathbb{C}$
		6	3	$(1, -1, 1, 0)$ $(0, 2, 0, -1)$	$\mathrm{SL}_2 \oplus \mathbb{C}$
		8	3	$(0, 0, 2, -1)$	$\mathrm{S}^2(\mathrm{SL}_2)$
		10	1	$(0, 0, 0, 1)$	$\mathbb{C}$
20.		2	4	$(-1, 2, -1, 0)$ $(0, -1, 2, -1)$ $(-2, 0, 0, 1)$ $(2, 0, -2, 1)$	$\mathbb{C} \oplus \mathbb{C}$ $\oplus \mathbb{C} \oplus \mathbb{C}$
(continued on next page)					

Nilpotent orbits in type EI (continued)					
Orbit	$K_{\mathbb{C}}$ diagram	i	$\dim \mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Highest weights of $\mathfrak{g}_{\mathbb{C}}^i \cap \mathfrak{p}_{\mathbb{C}}$	Prehomogeneous space
		4	2	$(-1, 1, 1, -1)$ $(2, -1, 0, 0)$	$\mathbb{C} \oplus \mathbb{C}$
		6	3	$(0, -1, 0, 1)$ $(1, 1, -1, 0)$ $(2, -2, 2, -1)$	$\mathbb{C} \oplus \mathbb{C} \oplus \mathbb{C}$
		8	2	$(-1, 1, -1, 1)$ $(1, 0, 1, -1)$	$\mathbb{C} \oplus \mathbb{C}$
		10	3	$(-1, 0, 1, 0)$ $(0, 2, 0, -1)$ $(2, -2, 0, 1)$	$\mathbb{C} \oplus \mathbb{C} \oplus \mathbb{C}$
		12	1	$(1, 0, -1, 1)$	$\mathbb{C}$
		14	2	$(1, -1, 1, 0)$ $(0, 2, -2, 1)$	$\mathbb{C} \oplus \mathbb{C}$
		16	1	$(0, 1, 0, 0)$	$\mathbb{C}$
		18	1	$(0, 0, 2, -1)$	$\mathbb{C}$
		22	1	$(0, 0, 0, 1)$	$\mathbb{C}$
21.		2	6	$(-1, 1, 1, -1)$ $(-2, 0, 0, 1)$ $(2, -2, 2, -1)$	$\mathrm{SL}_2 \oplus \mathbb{C}$ $\oplus \mathrm{S}^2(\mathrm{SL}_2)$
		4	3	$(0, -1, 0, 1)$ $(1, 0, 1, -1)$	$\mathbb{C} \oplus \mathrm{SL}_2$
		6	4	$(-1, 0, 1, 0)$ $(0, 2, 0, -1)$ $(2, -2, 0, 1)$	$\mathrm{SL}_2 \oplus \mathbb{C} \oplus \mathbb{C}$
		8	2	$(1, -1, 1, 0)$	SL_2
		10	3	$(0, 0, 2, -1)$	$\mathrm{S}^2(\mathrm{SL}_2)$
		14	1	$(0, 0, 0, 1)$	$\mathbb{C}$
22.		2	8	$(2, -2, 0, 1)$ $(1, 1, -1, 0)$	$(\mathrm{S}^2(\mathrm{SL}_2^1) \otimes \mathrm{SL}_2^2) \oplus \mathrm{SL}_2^1$
		4	4	$(1, 0, -1, 1)$	$(\mathrm{SL}_2^1 \otimes \mathrm{SL}_2^2)$
		6	4	$(1, -1, 1, 0)$ $(0, 2, -2, 1)$	$\mathrm{SL}_2^1 \oplus \mathrm{SL}_2^2$
		8	1	$(0, 1, 0, 0)$	$\mathbb{C}$
		10	2	$(0, 0, 0, 1)$	SL_2^2
23.		2	12	$(0, 2, -2, 1)$	$(\mathrm{S}^2(\mathrm{SL}_3) \otimes \mathrm{SL}_2)$
		4	3	$(0, 1, 0, 0)$	SL_3
		6	2	$(0, 0, 0, 1)$	SL_2

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