

**REALIZATIONS OF INVOLUTIVE AUTOMORPHISMS  
 $\sigma$  AND  $G^\sigma$  OF EXCEPTIONAL LINEAR LIE GROUPS  
 $G$ , PART III,  $G = E_8$**

By

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M. Berger [1] classified involutive automorphisms  $\sigma$  of simple Lie algebras  $\mathfrak{g}$  and determined the type of the subalgebras  $\mathfrak{g}^\sigma$  of fixed points. In the preceding papers [Y1], [Y2], we found involutive automorphisms  $\sigma$  and realized the subgroups  $G^\sigma$  of fixed points explicitly for the connected exceptional universal linear Lie groups  $G$  of type  $G_2$ ,  $F_4$ ,  $E_6$  and  $E_7$ . In this paper we consider the case of type  $E_8$ . Our results are as follows.

$G$	$G^\sigma$	$\sigma$			
$E_8^c$	$(SL(2, C) \times E_7^c) / \mathbf{Z}_2$	$\nu$			
	$Ss(16, C)$	$\tilde{\lambda}\gamma$			
$E_8^c$	$E_8$	$\tau\tilde{\lambda}$			
$E_8$	$(SU(2) \times E_7) / \mathbf{Z}_2$	$\nu$			
	$Ss(16)$	$\tilde{\lambda}\gamma$			
$E_8^c$	$E_{8(8)}$	$\tau\gamma$	$\tau\tilde{\lambda}\nu\gamma$	$\tau\sigma\gamma$	$\tau\nu\gamma$
$E_{8(8)}$	$(SL(2, \mathbf{R}) \times E_{7(7)}) / \mathbf{Z}_2 \times 2$	$\nu$			
	$(SU(2) \times E_{7(-5)}) / \mathbf{Z}_2$		$\nu$		
	$Ss(16)$	$\tilde{\lambda}\gamma$			
	$Sso(8, 8) \times 2$			$\tilde{\lambda}\gamma$	
	$Sso^*(16) \times 2$				$\tilde{\lambda}\gamma$
$E_8^c$	$E_{8(-24)}$	$\tau$	$\tau\tilde{\lambda}\nu$	$\tau\tilde{\lambda}\gamma$	$\tau\tilde{\lambda}\nu\sigma$
$E_{8(-24)}$	$(SL(2, \mathbf{R}) \times E_{7(-25)}) / \mathbf{Z}_2 \times 2$	$\nu$			
	$(SU(2) \times E_7) / \mathbf{Z}_2$		$\nu$		
	$(SU(2) \times E_{7(-5)}) / \mathbf{Z}_2$			$\nu$	
	$So(4, 12)$				$\sigma$
	$Sso^*(16) \times 2$		$\tilde{\lambda}\gamma$		

This paper is a continuation of [Y1], [Y2] and we use the same notations as them. So the numbering of sections and theorems starts from 5.1 and 5.1.1,

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