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	authors	• Manivel, Laurent	authors	• Laurent Manivel	DUPLICATES	904
	title	Configurations of lines and models of Lie algebras	title	Configurations of lines and models of Lie algebras		
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	abstract	The automorphism groups of the 27 lines on the smooth cubic surface or the 28 bitangents to the general quartic plane curve are well-known to be closely related to the Weyl groups of E_6 and E_7. We show how classical subconfigurations of lines, such as double-sixes, triple systems or Steiner sets, are easily constructed from certain models of the exceptional Lie algebras. For ${\mathfrak e}\_7$ and ${\mathfrak e}\_8$ we are lead to beautiful models graded over the octonions, which display these algebras as plane projective geometries of subalgebras. We also interpret the group of the bitangents as a group of transformations of the triangles in the Fano plane, and show how this allows to realize the isomorphism $PSL(3,F\_2)\simeq PSL(2,F\_7)$ in terms of harmonic cubes.Comment: 31 page	abstract	The automorphism groups of the 27 lines on the smooth cubic surface or the 28 bitangents to the general quartic plane curve are well-known to be closely related to the Weyl groups of E_6 and E_7. We show how classical subconfigurations of lines, such as double-sixes, triple systems or Steiner sets, are easily constructed from certain models of the exceptional Lie algebras. For e_7 and e_8 we are lead to beautiful models graded over the octonions, which display these algebras as plane projective geometries of subalgebras. We also interpret the group of the bitangents as a group of transformations of the triangles in the Fano plane, and show how this allows to realize the isomorphism PSL(3,F_2)â‰ƒ PSL(2,F_7) in terms of harmonic cubes.		
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