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Stephen A. Mitchell* (mitchell@math.washington.edu), Mathematics Department 354350, University of Washington, Seattle, WA 98195, and **Sara C. Billey**. *Smooth and palindromic Schubert varieties in affine Grassmannians.*

We completely determine the smooth and palindromic Schubert varieties in an affine Grassmannian, in all Lie types. Let X be an affine Schubert variety.

Theorem A: The following are equivalent: (a) X is smooth; (b) X satisfies Poincaré duality integrally; (c) X is a closed parabolic orbit. In particular, there are only finitely many smooth affine Schubert varieties in a fixed Lie type.

Theorem B: X is palindromic if and only if one of the following conditions holds: (a) X is a closed parabolic orbit; (b) X is a chain; (c) X is a "spiral variety" in type A; (d) X is a certain singular 9-dimensional variety in type B_3 .

In particular (1) except in type A_n , there are only finitely many palindromic affine Schubert varieties in a fixed Lie type; and (2) in types D,E, the variety X is smooth if and only if it is palindromic, whereas in all other types there are singular palindromics. (Received December 13, 2007)