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**Yves Benoist\*** ([benoist@math.u-psud.fr](mailto:benoist@math.u-psud.fr)), Universite Paris-Sud, Mathematics, Bat 425, 91405 Orsay, France, and **Jean-Francois Quint** ([quint@math.univ-paris13.fr](mailto:quint@math.univ-paris13.fr)), Universite Paris-Nord, 93430 Villetaneuse, France. *Invariant subsets and stationary probabilities on homogeneous spaces.*

Let  $G$  be a simple Lie group,  $X$  be a  $G$ -homogeneous space of finite volume, and  $H$  be a Zariski dense subgroup of  $G$ . We show that, the Haar probability on  $X$  is the only atom-free  $H$ -invariant probability on  $X$ . Moreover every  $H$ -invariant subset of  $X$  is either finite or dense. The proof of these facts implies also the stiffness property for stationary measures on  $X$ , uses random walks on  $X$ , and applies to other homogeneous spaces of finite volume. (Received September 11, 2008)