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Criterion for proper actions on homogeneous spaces of reductive groups

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Abstract. Let M be a manifold, on which a real reductive Lie group G acts transitively. The action of a discrete subgroup Γ on M is not always properly discontinuous. In this paper, we give a criterion for properly discontinuous actions, which generalizes our previous work [6] for an analogous problem in the continuous setting. Furthermore, we introduce the discontinuous dual $\pitchfork(H:G)$ of a subset H of G, and prove a duality theorem that each subset H of G is uniquely determined by its discontinuous dual up to multiplication by compact subsets.

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