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"Simultaneously dense and non-dense"orbits in homogeneous dynamics and
Diophantine approximation

Consider a non-compact homogeneous space X with the action of a diagonal
one-parameter subgroup. It is known that the set of points in X with bounded forward orbits has full Hausdorff dimension. Question: what about points with forward orbits both bounded and accumulating on a given z ∈ X? We prove that, barring a certain obvious obstruction, those points also form a set of large Hausdorff dimension. This is motivated by the subject of improving Dirichlet's Theorem in Diophantine approximation. Joint work with Manfred Einsiedler and Anurag Rao.