Hermitian curvature flow
on complex homogeneous manifolds

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Abstract. In this paper we study a version of the Hermitian curvature flow (HCF) considered by the author in [25]. We focus on complex homogeneous manifolds equipped with *submersion metrics*. We prove that this finite-dimensional space of metrics is invariant under the HCF and write down the corresponding ODE on the space of Hermitian forms on the underlying Lie algebra. Using these computations we construct HCF-Einstein metrics on G-homogeneous manifolds, where G is a complexification of a compact simple Lie group. We conjecture that under the HCF any submersion metric on such a manifold pinches towards the HCF-Einstein metric. For a nilpotent or solvable complex Lie group equipped with a right-invariant metric we investigate the blow-up behavior of the HCF.