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Spherical amoebae and K-orbits in spherical varieties

The amoeba of a subvariety Y in the algebraic torus $(\mathbb{C}^*)^n$ is its image in $\mathbb{R}^n$ under the logarithm map. It is well-known that the amoeba of Y approaches its tropical variety as the base of logarithm goes to 0. In this talk we address the question of extending the above from subvarieties in a torus to subvarieties in a reductive algebraic group G or more generally a spherical homogeneous space G/H. This naturally becomes related to the problem of parametrizing K-orbits in G/H (for a maximal compact subgroup K in G) and can be considered as a generalization of the well-known Cartan decomposition (singular value decomposition) and Iwasawa decomposition in Lie theory. I will briefly cover some necessary background. This is a joint work in progress with Victor Batyrev, Megumi Harada and Johannes Hofscheier.