PARABOLIC PERTURBATIONS OF UNIPOTENT FLOWS

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Unipotent flows are classical examples of parabolic flows, namely flows for which the divergence of nearby points is polynomial in time. Very little is known about the ergodic properties of general smooth parabolic flows, even for smooth perturbations of homogeneous ones, with the only exception of the case of time-changes. In this talk, I will show that mixing persists for a class of smooth perturbations of any unipotent flow which are not time-changes. In particular, we consider certain flows on compact quotients of $SL(3, \mathbb{R})$ which are obtained by adding to a unipotent flow a perturbation in a commuting direction. The proof relies on a geometric shearing mechanism together with a non-homogeneous version of Mautner Phenomenon.