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Toroidal Affine Nash Groups

A toroidal affine Nash group is the affine Nash group analogue of an anti-affine algebraic group. In this note, we prove analogues of Rosenlicht's structure and decomposition theorems: (1) Every affine Nash group G has a smallest normal affine Nash subgroup H such that G/H is an almost linear affine Nash group, and this H is toroidal. (2) If G is a connected affine Nash group, then there exist a largest toroidal affine Nash subgroup G_{ant} and a largest connected, normal, almost linear affine Nash subgroup G_{aff}. Moreover, we have $G = G_{\mathrm{ant}}G_{\mathrm{aff}}$, and $G_{\mathrm{ant}} \cap G_{\mathrm{aff}}$ contains $(G_{\mathrm{ant}})_{\mathrm{aff}}$ as an affine Nash subgroup of finite index.

Keywords: Real algebraic groups, anti-affine algebraic groups, Rosenlicht's theorem, affine Nash groups, abelian groups.

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