

# Scalar oscillatory integrals on smooth spaces of homogeneous type

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**Abstract:** We consider a generalization of the notion of spaces of homogeneous type, inspired by recent work of Street on the multi-parameter Carnot-Carathéodory geometry, which imbues such spaces with differentiability structure. The setting allows one to formulate estimates for scalar oscillatory integrals on these spaces which are uniform and respect the underlying geometry of both the space and the phase function. As a corollary we obtain a generalization of a theorem of Bruna, Nagel, and Wainger on the asymptotic behavior of scalar oscillatory integrals with smooth, convex phase of finite type.