The shearlet transform and asymptotic behavior of Lizorkin distributions

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The shearlet transform is a powerful technique used for achieving effective representation of high-dimensional signals. In a certain sense, shearlets behave for high-dimensional signals as wavelets do for onedimensional ones. The continuous shearlet transform theory for square integrable functions was developed by Kutyniok and Labate. Recently, Bartolucci, Pilipović and Teofanov extended and analyzed the shearlet transform and the shearlet synthesis operator in the Lizorkin type spaces of test functions and distributions.

In this paper we study the asymptotic behavior of Lizorkin distributions through the shearlet transform. We prove several Abelian and Tauberian results that characterize the quasiasymptotic behavior of Lizorkin distributions in terms of their shearlet transform.