

On anisotropic Triebel-Lizorkin type spaces, with applications to the study of pseudo-differential operators

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Abstract. A construction of Triebel-Lizorkin type spaces associated with flexible decompositions of the frequency space \mathbb{R}^d is considered. The class of admissible frequency decompositions is generated by a one parameter group of (anisotropic) dilations on \mathbb{R}^d and a suitable decomposition function. The decomposition function governs the structure of the decomposition of the frequency space, and for a very particular choice of decomposition function the spaces are reduced to classical (anisotropic) Triebel-Lizorkin spaces. An explicit atomic decomposition of the Triebel-Lizorkin type spaces is provided, and their interpolation properties are studied. As the main application, we consider Hörmander type classes of pseudo-differential operators adapted to the anisotropy and boundedness of such operators between corresponding Triebel-Lizorkin type spaces is proved.
