Function spaces of varying smoothness

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Abstract

We deal with function spaces of varying smoothness. We define the spaces , where the function $\mathbb{S} : x \mapsto s(x)$ is negative and determines the smoothness pointwise. First we show some basic properties and then we use a wavelet decomposition to get information about local smoothness behavior of distributions. The main result is a characterization of the spaces by weighted sequence space norms of the wavelet coefficients. This assertion is used to prove an interesting connection to the so-called two-microlocal spaces $C^{s,s'}(x^0)$.