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Function spaces with variable exponents

We talk about function spaces of Besov and Triebel-Lizorkin type with variable smoothness and variable integrability. Here the variable smoothness is measured in the 2-microlocal sense with admissible weight sequences and the integrability exponents $p(\cdot)$ and $q(\cdot)$ are functions depending on the space variable x which map into $(0, \infty]$.
Spaces of this type have attracted much attention in recent years due to their applications in the theory of electrorheological fluids and image processing. We show their definitions, some properties and talk about different characterizations.