Pointwise multipliers of Besov spaces

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Abstract

Let Ω be a domain in $\mathbb{R}^d$. For a given normed space of functions $X(\Omega)$ we asked for the set of all functions $f : \Omega \to \mathbb{C}$, such that the associated linear operator

$$T_f : \ g \mapsto f \cdot g$$

maps the space $X(\Omega)$ continuously into itself. If f is such a function, we shall call it a pointwise multiplier for the space $X(\Omega)$.
The study of pointwise multipliers belongs to the key subjects in the theory of function spaces. For this we refer to the two monographs of Maz'ya and Shaposnikova:

• *Theory of multipliers in spaces of differentiable functions*, Pitman, Boston, 1985.
• *Theory of multipliers in spaces of differentiable functions,* Springer, Grundlehren der mathematischen Wissenschaften Vol. **337**, Berlin, 2009.

The aim of my talk will be to give a survey about the known results with respect to Besov spaces on $\mathbb{R}^d$. Special emphasis will be paid to the question under which conditions the characteristic function of a set $\Omega \subset \mathbb{R}^d$ can be a pointwise multiplier in those spaces.