TENSOR PRODUCTS OF SOBOLEV-BESOV SPACES AND APPLICATIONS

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ABSTRACT. Let $S_{p,p}^{(r_1,\ldots,r_d)}B(\mathbb{R}^d)$ and $S_{p,p}^{(r_1,\ldots,r_d)}H(\mathbb{R}^d)$, $r_i \in \mathbb{R}$, denote Besov as well as fractional Sobolev spaces of d-variate functions with dominating mixed smoothness. By using appropriate tensor-(quasi-)norms we observe the tensor product structure

$$S_{p,p}^{(r_1,\ldots,r_d)}B(\mathbb{R}^d) = B_{p,p}^{r_1}(\mathbb{R}) \otimes \ldots \otimes B_{p,p}^{r_d}(\mathbb{R})$$

for $0 < p < \infty$ and $r_i > 0$. These properties have an application for particular problems in approximation theory and numerical analysis.

The results are part of a joint work with Winfried Sickel.