An In-depth Look of Rychkov's Universal Extension Operator for Lipschitz Domains

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Given a bounded Lipschitz domain $\Omega \subset \mathbb{R}^n$, Rychkov showed that there is a linear extension operator $\mathcal{E}$ for Ω which is bounded in all Besov and Triebel-Lizorkin spaces. In this paper we introduce some new estimates for the extension operator $\mathcal{E}$ and give some applications. We prove the equivalent norms $\|f\|_{\mathscr{A}^s_{pq}(\Omega)} \approx \sum_{|\alpha|\leq m} \|\partial^\alpha f\|_{\mathscr{A}^{s-m}_{pq}(\Omega)}$ for general Besov and Triebel-Lizorkin spaces. We also derive some quantitative smoothing estimates of the extended function and all its derivatives in $\overline{\Omega}^c$ up to boundary. This is a joint work with Ziming Shi.