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## Trace Principle for Riesz Potentials on Herz Spaces and Applications

Investigating mathematical inequalities surrounding Riesz potentials is crucial for estimating functions based on their gradients, giving rise to the celebrated Sobolev inequalities. These inequalities serve as cornerstones in the analysis of partial differential equations. Addressing the trace problem for Riesz Potentials involves identifying positive Borel measures $\mu$ on $\mathbb{R}^n$ such that the Riesz potential maps a given function space $\mathcal{F}(\mathbb{R}^n, m)$ boundedly into another function space $\mathcal{F}'(\mathbb{R}^n, \mu)$. In this talk, we discuss the trace problem for Riesz potentials on Herz spaces, establishing new trace inequalities. We rigorously analyze the optimality of conditions on specific parameters and demonstrate the applicability of our results through Sobolev-type inequalities, including the Gagliardo-Nirenberg-Sobolev inequality and the fractional integration theorem within the Herz space framework. Additionally, our findings yield a Sobolev embedding theorem for Herz-type Sobolev spaces.

**Keywords:** Riesz potential; Adams' trace inequality; Herz spaces; Sobolev inequalities

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