Abstract

Necessary and sufficient conditions governing one and two weight inequalities for one-sided strong fractional maximal operators, one-sided and Riesz potentials with product kernels are established on the cone of non-increasing functions. From the two–weight results it follows criteria for the trace inequality $\left(L^p_{dec}(\mathbb{R}^n_+) \to L^q(v, \mathbb{R}^n_+)\right.$ boundedness $\left.\right)$ for these operators, where v, in general, is not product of one-dimensional weights. Various type of two-weight necessary and sufficient conditions for the discrete Riemann–Liouville transform with product kernels are also established. The most of the derived two-weight results (continuous and discrete) are new even for potentials with single kernels.