

Year: 2021

Vol.: 98

Fasc.: 3-4

Title: Weighted Hardy and Carleson measure spaces estimates for fractional integrations

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In this paper, we consider the boundedness for fractional integrations on Hardy spaces and Carleson measure spaces. Precisely, we establish some Hardy and Carleson measure spaces estimates for a large class of convolution fractional integrations. As corollaries, the well-known Hardy–Littlewood–Sobolev inequalities for Riesz potentials on Lebesgue spaces are extended to weighted Hardy and Carleson measure spaces, as well as to variable Hardy and Carleson measure spaces. Some of these estimates are new even in the unweighted case.

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