

Positive sparse domination of variational Carleson operators

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Abstract. Due to its nonlocal nature, the r -variation norm Carleson operator C_r does not yield to the sparse domination techniques of Lerner [15, 17], Di Plinio and Lerner [6], Lacey [14]. We overcome this difficulty and prove that the dual form of C_r can be dominated by a positive sparse form involving L^p averages. Our result strengthens the L^p -estimates by Oberlin *et al.* [18]. As a corollary, we obtain quantitative weighted norm inequalities improving the results in [8] by Do and Lacey. Our proof relies on the localized outer L^p -embeddings of Di Plinio and Ou [7] and Uraltsev [19].

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