A sparse bound for an integral operator with wave propagator

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Abstract:
We discuss a sparse bound for a time-integral operator with wave propagator when dimension is greater than 2. In the case, dimension is higher than 3, our bound is optimal in some sense. Main ingredients of our argument are H^1 (Hardy space) bound of wave propagator by Miyachi ('80) and Fourier series expansion to exploit the smoothing effect from the time-integral. Moreover, we rely on a criterion for sparse bounds by Lerner and Nazarov. As a by product, we have weighted estimates for maximal Riesz means with Muckenhoupt weights.