DISPERSIVE ESTIMATES FOR FLOWS OF FRACTIONAL SCHRÖDINGER SEMIGROUPS

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Let X be a metric space with a doubling measure satisfying $\mu(B) \gtrsim r_B^n$ for any ball B with any radius $r_B > 0$. Let L be a non negative selfadjoint operator on $L^2(X)$. We assume that e^{-tL} satisfies a Gaussian upper bound and that the flow e^{itL} satisfies a typical $L^1 - L^\infty$ dispersive estimate of the form

$$\|e^{itL}\|_{L^1 \to L^\infty} \lesssim |t|^{-\frac{n}{2}}.$$

Then we prove a similar $L^1 - L^\infty$ dispersive estimate for a general class of flows $e^{it\phi(L)}$, with $\phi(r)$ of power type near 0 and near ∞. In the case of fractional powers $\phi(L) = L^\nu$, $\nu \in (0, 1)$, we deduce dispersive estimates for e^{itL^ν} with data in Sobolev, Besov or Hardy spaces H_L^p with $p \in (0, 1]$, associated to the operator L.

This is joint work with The Anh Bui, Piero D'Ancona and Xuan Thinh Duong.