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Semi-Classical Behavior of the Scattering Amplitude for Trapping Perturbations at Fixed Energy

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Abstract. We study the semi-classical behavior as $h \longrightarrow 0$ of the scattering amplitude $f(\theta, \omega, \lambda, h)$ associated to a Schrödinger operator $P(h) = -\frac{1}{2}h^2\Delta + V(x)$ with short-range trapping perturbations. First we realize a spatial localization in the general case and we deduce a bound of the scattering amplitude on the real line. Under an additional assumption on the resonances, we show that if we modify the potential $V(x)$ in a domain lying behind the barrier $\{x : V(x) > \lambda\}$, the scattering amplitude $f(\theta, \omega, \lambda, h)$ changes by a term of order $\mathcal{O}(h^\infty)$. Under an escape assumption on the classical trajectories incoming with fixed direction ω, we obtain an asymptotic development of $f(\theta, \omega, \lambda, h)$ similar to the one established in the non-trapping case.

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