Abstract

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"**Semi-classical Green functions**"

a joint work with A. Anikin[2], S. Dobrokhotov[2] and V. Nazaikinskii[2]

Let $H(x,p) \sim H_0(x,p) + hH_1(x,p) + \cdots$ be a semi-classical Hamiltonian on $T^*\mathbf{R}^n$, and $\Sigma_E = \{H_0(x,p) = E\}$ a non critical energy surface. Consider f_h a semi-classical distribution (the "source") microlocalized on a Lagrangian manifold Λ which intersects cleanly the flow-out Λ_+ of the Hamilton vector field X_{H_0} in Σ_E. Using Maslov canonical operator, we look for a semi-classical distribution u_h satisfying the limiting absorption principle and $H^w(x, hD_x)u_h = f_h$ (semi-classical Green function). We focus on the case where the Hamiltonian is of Helmholtz type $H(x,p) = |p|^m \frac{1}{\rho(x)}$, $m = 1, 2$ and the source is either microlocalized on the conormal of a hypersurface of $\mathbf{R}^n$, or has the form of a "Bessel beam", i.e. Λ is the "cylinder" $\Lambda = \{x = X(\varphi,\psi) = \varphi\omega(\psi), p = P(\varphi,\psi) = \omega(\psi), \varphi \in \mathbf{R}, \omega \in \mathbf{S}^{n-1}\}$, when $n = 2, 3$.

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