

VISCOSITY LIMITS FOR 0TH ORDER OPERATORS

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For self-adjoint pseudodifferential operators of order 0, Colin de Verdiere and Saint-Raymond introduced natural dynamical conditions (motivated by the study of internal waves in fluids) guaranteeing absolute continuity of the spectrum. I will present an alternative approach to obtaining such results based on Melrose's radial propagation estimates from scattering theory (joint work with S. Dyatlov). I will then explain how an adaptation of the Helffer–Sjostrand theory of scattering resonances shows that in a complex neighbourhood of the continuous spectrum viscosity eigenvalues have limits as viscosity goes to 0. Here the viscosity eigenvalues are the eigenvalues of the original operator to which an anti-self-adjoint elliptic 2nd order operator is added. This justifies claims made in the physics literature (joint work with J. Galkowski).