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Microlocal analysis near null infinity on asymptotically flat spacetimes

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There are a number of reasons due to which it is advantageous to have a phase space based, or microlocal, approach available for analyzing wave propagation. In this talk I will explain a microlocal framework for wave propagation on asymptotically flat spacetimes of arbitrary dimension which in particular includes operator corresponding to Lorentzian metrics arising from solutions of Einstein's equations in the 4 spacetime dimensional setting. On the compactification of Minkowski space that underlies this, which is a manifold with corners (with the usual null infinity, scri, being a boundary hypersurface), the operators lie in a combination of Melrose's totally characteristic (also called b), and Mazzeo's edge pseudodifferential operator algebras. I will give an introduction via a simpler setting (which includes Minkowski space and a different class of perturbations), and then explain the reasons for, and complications with, moving to the present setting. Along the way, I will also briefly describe the related Klein-Gordon work of Ethan Sussman. This is joint work with Peter Hintz.

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