NATHAN CARRUTH, University of Toronto/BIMSA

Highly localised gravitational waves in polarised translational symmetry

We discuss results on the existence of highly localised wave solutions to the vacuum Einstein equations in polarised translational symmetry. These require ancillary finite-time existence results for solutions with initial data whose amplitude and concentration make certain low Sobolev norms large. We describe a coordinate scaling extending the short-pulse ansatz of Christodoulou under which the initial amplitude becomes small, and show that existence follows from using decay obtained from a Klainerman-Sobolev inequality. We will then describe solutions which are highly spatially localised initially and remain so for finite time. We will discuss the possibility of obtaining measure-valued solutions by passing to a limit. This is joint work with Spyros Alexakis.