

SPEAKER:

Lili He, Johns Hopkins University

TITLE:

Scattering from Infinity of the Maxwell Klein Gordon Equations in Lorenz Gauge

ABSTRACT:

We prove global existence backwards from the scattering data posed at infinity for the Maxwell Klein Gordon equations in Lorenz gauge satisfying the weak null condition. The asymptotics of the solutions to the Maxwell Klein Gordon equations in Lorenz gauge were shown to be wave like at null infinity and homogeneous towards timelike infinity by Candy-Kauffman-Lindblad, and expressed in terms of radiation fields, and thus our scattering data will be given in the form of radiation fields in the backward problem. We give a refinement of the asymptotics results by Candy-Kauffman-Lindblad, and then making use of this refinement, we find a global solution which attains the prescribed scattering data at infinity. Our result corresponds to "existence of scattering states" in the scattering theory. Our work is more delicate since it involves nonlinearities with fewer derivatives. The method of proof relies on a suitable construction of the approximate solution from the scattering data, a weighted conformal Morawetz energy estimate and a spacetime version of Hardy inequality.