Phase retrieval via data from multiple media

Kui Ren*†[1]

[1]Columbia University – United States

Abstract

This talk is about phase retrieval for wave fields, aiming to recover the phase of an incoming wave from multi-plane intensity measurements behind different types of linear and nonlinear media. We show that unique phase retrieval can be achieved by utilizing intensity data produced by multiple media. This uniqueness does not require prescribed boundary conditions for the phase in the incidence plane, in contrast to existing phase retrieval methods based on the transport of intensity equation. Moreover, the uniqueness proofs lead to explicit phase reconstruction algorithms. Numerical simulations are presented to validate the theory. This is based on joint works with Yan Cheng and Nathan Soedjak.

*Speaker

†Corresponding author: kr2002@columbia.edu