Transmission eigenchannels in disordered media

Chia Wei Hsu∗∗

1Yale University – United States

Abstract

While light scattering hinders the transfer of energy and information through disordered media, control over the optical transport can still be achieved by selectively coupling into the eigenchannels of the transmission matrix. In this talk, we will describe two unique aspects of transmission eigenchannels, both revealed through a combination and experiment and theory. First, we show that correlations between speckles widen the eigenvalue distributions, enabling a global control over light transmitted through multiple scattering. Second, we show that transmission eigenchannels are spatially localized in the transverse directions, extending a finite width even in open geometries where no transverse confinement is imposed a priori.