Phase noise to intensity noise conversion in EIT

YANHONG XIAO, TUN WANG, MICHAEL HOHENSEE, IRINA NOVIKOVA, DAVID PHILLIPS, SUSANNE YELIN, RONALD WALSWORTH, Harvard-Smithsonian — Laser phase noise can induce intensity noise after interacting with an atomic medium. This process plays a critical role in determining the performance of systems employing electromagnetically induced transparency (EIT), including certain types of atomic clocks. We present an experimental and theoretical study of EIT noise spectra and correlations in a Rb vapor cell. Variations of noise features with laser frequency and two-photon detunings are studied systematically with particular emphasis on noise correlations between the two output fields.