Abstract Submitted
for the DAMOP12 Meeting of
The American Physical Society

Path Entangled Photon Number States in the Presence of Loss for Quantum Metrology CHASE BRIGNAC, KEBEI JIANG, YI WENG, JONATHAN DOWLING, Louisiana State University Physics & Astronomy —
Quantum states of light have long been researched to achieve greater phase resolution and phase sensitivity than what is possible classically. In 2009 Huver found that path-entangled photon number states where there are one or more photons in each path drastically improves on the performance with loss compared to N00N states in the presence of photon loss. The amplitude of the photodetection operator applied to such states may be expressed as a function of the off- diagonal terms in the reduced density matrix. In path-entangled photon number states there are two paths a and b with different numbers of photons. We have maximized the amplitude of the expectation value of the detection operator with respect to path-entangled photon number states under loss to better understand what photon number states are optimal for practical application.

Chase Brignac
Louisiana State University Physics & Astronomy

Date submitted: 31 Jan 2012 Electronic form version 1.4