Bi-photon generation with imaginary gain

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We investigate and characterize the photon correlations in four waves mixing (FWM) across the classical-to-quantum transition by means of a two-photon interference effect that can clearly distinguish between classical and quantum behavior. In our experiment ultra broad badwidth FWM is generated from narrowband picosecond scale pump pulses in a short piece of highly nonlinear photonic crystal fiber (PCF). We explore the quantum - classical nature of the light by observing the loss dependence of the interference contrast at various intensities across the quantum-to-classical transition. We observe quantum collapses and revivals of the interference contrast that are the signature of bi-photon generation with imaginary gain – a unique quantum regime of FWM.