Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Optical Parametric Amplification via Difference Frequency WAYNE HUANG, HERMAN BATELAAN, University of Nebraska-Lincoln, MARLAN SCULLY, Texas A&M University — Conventionally, broadband frequency conversion is achieved through spontaneous parametric down conversion. Such a process requires a pump source with frequencies higher than the targeted frequencies. This presents the limitation for light generation in the ultraviolet regime. Here, we present a different approach for optical parametric amplification using a difference-frequency pump. The prerequisite for optical amplification is complex-valued nonlinear susceptibility, which can only be realized in non-Hermitian optical systems. Such an effect may be used for realizing all-optical table-top XUV lasers. We will also discuss our first demonstration of this novel effect in a wave system using coupled acoustic Fabry-Perot cavities.

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Date submitted: 03 Feb 2016 Electronic form version 1.4