Contribution ID: **219**   Type: **Poster**

Non-perturbative solution to quantum parametric down-conversion in open optical systems

Tuesday 13 December 2022 18:45 (15 minutes)

We develop a non-perturbative description of spontaneous parametric down-conversion in the high-gain regime for nanostructured systems with arbitrary amounts of loss and arbitrary dispersion. As an example, we use it numerically to investigate integrated quantum spectroscopy at high gain.

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Session Classification: Poster session

Track Classification: ANZCOP: ANZCOP: Quantum optics