

Abstract Submitted
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Cavity-Enhanced Photon Emission from a Single Germanium-Vacancy Center in a Diamond Membrane ERIKA JANITZ, McGill University, RASMUS HOEY JENSEN, YANNIK FONTANA, Technical University of Denmark, YI HE, Carnegie Mellon University, OLIVIER GOBRON, ILYA P. RADKO, Technical University of Denmark, MIHIR BHASKAR, RUFFIN EVANS, Harvard University, CESAR DANIEL RODRIGUEZ ROSENBLUETH, McGill University, ALEXANDER HUCK, ULRIK LUND ANDERSEN, Technical University of Denmark, LILIAN CHILDRESS, McGill University — The nitrogen-vacancy (NV) center in diamond has been explored extensively as a light-matter interface for quantum information applications, however it is limited by low coherent photon emission and spectral instability. Alternatively, group-IV diamond defects such as the germanium-vacancy (GeV) center have gained attention for their superior optical properties. Inspired by this, we explore an interface based on a single GeV in a diamond membrane coupled to a finesse 11,000 fiber cavity, obtaining a 30-fold enhancement in the spectral density of emission. This work sets the stage for cryogenic experiments, where we predict a factor of 20 increase in the spontaneous emission rate.

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