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Novel Nanophotonic Cavity Design for Diamond Color-Centers
MICHELLE CHALUPNIK, ERIK KNALL, BARTHOLOMEUS MACHIELSE, CLEAVEN CHIA, STEFAN BOGDANOVIC, MARKO LONCAR, Harvard University — Nanocavities are a powerful tool for quantum optics, particularly when paired with solid-state emitters such as silicon-vacancy centers in diamond. Non-traditionally shaped cavities can offer benefits such as low mode volume or more favorable strain/electric field overlap. I will show simulation and fabrication results for diamond nanocavities made with non-traditionally shaped unit cells. In particular, cavities with bowtie cutouts or with ribbed cutouts can offer unique benefits compared to cavities with elliptical or circular cutouts. Such cavities have applications in areas of quantum information including as quantum repeaters.

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