

Abstract Submitted
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Nanowire Plasmon Resonators NATHALIE SNAPP, CHUN YU, DIRK ENGLUND, FRANK KOPPENS, MIKHAIL LUKIN, HONGKUN PARK, Harvard University — Strong interactions between light and matter can be engineered by confining light to small volumes. Nanoscale plasmonic structures are capable of confining light well below the diffraction limit; however, building resonant cavities in these devices has proven difficult due to large material losses. We report the design and fabrication of one-dimensional plasmonic crystals utilizing patterned dielectric surrounding low-loss, highly crystalline silver nanowires to make distributed bragg reflectors (DBR) with stopbands of 40-50 nm in the visible range. Introduction of a defect in the DBR causes a resonant feature to appear in the stopband. These plasmonic cavities have a Q of up to 45 in a sub-diffraction limit mode volume. Quantum dots coupled to these devices show modified fluorescence spectra, as well as emission enhancement at the cavity resonance.

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