

Abstract Submitted
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Nanowire Plasmon Resonators NATHALIE DE LEON, BRENDAN SHIELDS, CHUN YU, Harvard University, DIRK ENGLUND, Columbia University, ALEXEY AKIMOV, MIKHAIL LUKIN, HONGKUN PARK, Harvard University — Strong interactions between light and matter can be engineered by confining light to a small volume for an extended period of time. Nanoscale plasmonic structures can concentrate light well below the diffraction limit, but realization of small mode-volume plasmon cavities remains an outstanding challenge. We propose and demonstrate a new approach for realization of nanoscale plasmon resonators enabling strong light-matter interaction. In our approach, chemically synthesized silver nanowires are surrounded by patterned dielectric to create resonators with mode volumes that are two orders of magnitude below the diffraction limit and quality factors approaching 100. We show that they can be used to enhance spontaneous emission rates of CdSe quantum dots and single diamond nitrogen-vacancy centers by a factor larger than 20 at the cavity resonance.

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