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Robust Solid State Quantum System Operating at 800 K.

MEHRAN KIANINIA, SHERIF ABDULKADER TAWFIK, BLAKE R, TOAN TRONG TRAN, MIKE FORD, IGOR AHARONOVICH, MILOS TOTH, University of Technology Sydney, MAU GROUP TEAM — Realization of Quantum information and communications technologies requires robust, stable solid state single photon sources. However, most existing sources cease to function above cryogenic or room temperature due to thermal ionization or strong phonon coupling which impede their emissive and quantum properties. Here we present an efficient single photon source based on a defect in a van der Waals crystal that is optically stable and operates at elevated temperatures of up to 800 K. The quantum nature of the source and the photon purity are maintained upon heating to 800 K and cooling back to room temperature. Our report of a robust high temperature solid state single photon source constitutes a significant step to-wards practical, integrated quantum technologies for real-world environments.

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