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Electrically Detected Pulsed ENDOR in Phosphorus-Doped Silicon[1] FELIX HOEHNE, LUKAS DREHER, Walter Schottky Institut, Technische Universitaet Muenchen, Am Coulombwall 3, 85748 Garching, Germany, HANS HUEBL, Walther-Meissner-Institut, Bayerische Akademie der Wissenschaften, Walther-Meissner-Strasse 8, 85748 Garching, Germany, MARTIN STUTZMANN, MARTIN S. BRANDT, Walter Schottky Institut, Technische Universitaet Muenchen, Am Coulombwall 3, 85748 Garching, Germany — We demonstrate the electrical detection of X-band electron nuclear double resonance (ENDOR) in phosphorus-doped silicon at 4 K. A pulse sequence analogous to Davies ENDOR in conventional electron spin resonance is used to measure the nuclear spin transition frequencies of the ^{31}P nuclear spins, where the ^{31}P electron spins are detected electrically via spin-dependent transitions through Si/SiO_2 interface states. In addition, electrical detection of coherent nuclear spin oscillations is shown, demonstrating the feasibility to electrically read out the spin states of possible nuclear spin qubits. Combining the enhanced sensitivity of electrically-detected magnetic resonance and the wide range of applications of pulsed ENDOR, this techniques could be a versatile tool to study paramagnetic defects in semiconductor nanostructures.

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