

## Quantum Physics

# Voltage controlled nuclear polarization switching in a single InGaAs quantum dot

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Sharp threshold-like transitions between two stable nuclear spin polarizations are observed in optically pumped individual InGaAs self-assembled quantum dots embedded in a Schottky diode when the bias applied to the diode is tuned. The abrupt transitions lead to the switching of the Overhauser field in the dot by up to 3 Tesla. The bias-dependent photoluminescence measurements reveal the importance of the electron-tunneling-assisted nuclear spin pumping. We also find evidence for the resonant LO-phonon-mediated electron co-tunneling, the effect controlled by the applied bias and leading to the reduction of the nuclear spin pumping rate.

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