

Dynamic nuclear polarization with three electrons in a vertical double quantum dot

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Abstract

We report the observation of dynamic nuclear polarization in a vertical double quantum dot, as a result of a hyperfine interaction with three confined electrons. Our data allow us to distinguish three pumping regimes, characterized by different magnitudes and directions of polarization. Corresponding electron-nuclear spin dynamics is understood by considering relevant three-electron states mixed by hyperfine interaction. Also, an extremely long nuclear spin relaxation time is reported. © 2013 American Physical Society.

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