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Nuclear spin diffusion in quantum confined semiconductor nanostructures DANIEL HENRIKSEN, IONEL TIFREA, California State University Fullerton — We analyze the nuclear spin diffusion effect in semiconductor quantum wells in connection with dynamical nuclear polarization under optical pumping. The natural confinement provided by the particular geometry of quantum well structures is responsible for a position dependent nuclear spin relaxation time and a reduced nuclear spin diffusion. In particular, we consider the case of GaAs quantum wells within GaAlAs barriers and analyze the nuclear spin diffusion for As nuclei. Our results, obtained for different nuclear spin diffusion constants, show that nuclear spin diffusion has a relatively small effect on the overall polarization of As nuclei in these structures.

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