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Long-lived electron spins in a modulation doped (100) GaAs quantum well JOHN COLTON, DAVID MEYER, KEN CLARK, DANIEL CRAFT, JANE TANNER, TYLER PARK, PHIL WHITE, Brigham Young University — We have measured T_1 spin lifetimes of a 14 nm modulation-doped (100) GaAs quantum well using a time-resolved pump-probe Kerr rotation technique. The quantum well was selected by tuning the wavelength of the probe laser. T_1 lifetimes in excess of 1 microsecond were measured at 1.5 K and 5.5 T, exceeding the typical T_2^* lifetimes that have been measured in GaAs and II-VI quantum wells by orders of magnitude. We observed effects from nuclear polarization, which were largely removable by simultaneous nuclear magnetic resonance, along with two distinct lifetimes under some conditions that likely result from probing two differently-localized subsets of electrons.

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