

Abstract Submitted
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Theory for Beats Observed in Optical Orientation Experiments on n-GaAs¹ NICHOLAS HARMON, WILLIAM PUTIKKA, Ohio State University, ROBERT JOYNT, University of Wisconsin — At low temperatures in n-type semiconductors optical orientation experiments can create two types of spin states: itinerant states in the conduction band and localized states on the donor sites. These two states will in general have different gyromagnetic ratios, and will thus precess at different frequencies when the system is put into a magnetic field. Strong evidence for two types of spins would be to see beats in optical orientation experiments. We have developed a model in the context of coupled Bloch equations to describe this phenomenon. Unpublished data by Awschalom and Kikkawa on n-GaAs at a temperature of 5 K and in a magnetic field of 6 T show beats. We apply our model to this data and interpret it in terms of spins in a Landau level formed from the conduction band states and localized spins on the donor sites.

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