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Optical Aharonov-Bohm Effect for type-II InAs Quantum Dots¹ VINCENT R. WHITESIDE, IAN R. SELLERS², BRUCE D. MCCOMBE, SUNY Buffalo, HUIYUN LIU³, University College London — The magnetic field dependence of the ground- and excited-state transitions in InAs quantum dots (QD), capped with a strain reducing layer of $GaAs_{0.76}Sb_{0.26}$, which results in a type-II band alignment, has been studied by magneto-photoluminescence (magneto-PL) spectroscopy. Oscillations in the PL intensity of both the excited state and ground state magneto-PL are observed. Similar oscillations in intensity have been previously attributed to the Optical Aharonov-Bohm (OAB) effect in other type-II QD systems. In the present case the ground state oscillations are only observed at low excitation power, for which only the ground state is occupied. At higher excitation power the excited state oscillations are more pronounced than the ground state oscillations. The room temperature emission wavelength of these QDs matches the optical telecommunications window at 1.55 μ m, so the OAB effect in these structures may be useful in future devices.

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