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Optical Aharonov-Bohm Effect in $Al_{0.08}Ga_{0.92}As/Al_{.25}Ga_{0.75}As$ Quantum Wells[1] ANDREAS RUSS, LARS SCHWEIDENBACK, JOSEPH MURPHY, ALEXANDER CARTWRIGHT, ATHOS PETROU, SUNY at Buffalo, Buffalo, NY, GEORGE KIOSEOGLOU, University of Crete, Heraclion, Greece, ALEXANDER GOVOROV, Ohio University, Athens, OH, AUBREY HANBICKI, BEREND JONKER, Naval Research Laboratory, Washington DC — The photoluminescence (PL) from $Al_{0.08}Ga_{0.92}As/Al_{.25}Ga_{0.75}As$ quantum wells (QW) was studied as function of magnetic field applied along the normal to the QW planes. The PL intensity exhibits two maxima at 2.3 and 4.9 tesla. The time-resolved PL from the same sample has a decay time which is one order of magnitude longer than the PL from a GaAs/AlGaAs QW, indicating that the recombination in the AlGaAs QW is spatially indirect. The PL intensity oscillations are attributed to the optical Aharonov-Bohm effect associated with spatially quasi-indirect excitons, which are located in the vicinity of islands with lower Al composition. The holes are localized by the islands, while the electrons move around them in a ring-like geometry. This model is in agreement with the interpretation of earlier results from $Al_xGa_{1-x}As/Al_yGa_{1-y}As$ Fe spin-LEDs.

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