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Quantum coherence oscillations in InSb and InAs J.A. PETERS, Department of Physics, Ohio University, HONG CHEN, J.J. HEREMANS, Department of Physics, Virginia Tech, N. GOEL, S.J. CHUNG, M.B. SANTOS, Department of Physics and Astronomy, University of Oklahoma, W. VAN ROY, G. BORGHS, IMEC, Leuven, Belgium — Quantum oscillation phenomena in parallel arrays of loops have been investigated in InSb/AlInSb and InAs/AlGaSb heterostructures, notable for their strong spin-orbit interaction. The arrays consist of parallel lines of hexagonal lattice cells, forming linear concatenations of loops. From the h/2e periodicity, the dominance of Altshuler-Aronov-Spivak (AAS) oscillations is deduced. Measurement of the temperature dependence of the oscillations enables the extraction of spin and phase coherence lengths in InSb and InAs. The spin coherence lengths show a weak drop with increasing temperature, akin to the mobility mean free path behavior, and consistent with a dominant Elliott-Yafet related spin relaxation mechanism in both heterostructures. The phase coherence lengths follow a power law without observed saturation at the lowest temperatures. NSF DMR-0094055 (JJH), DMR-0080054, DMR-0209371 (MBS).

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