

Abstract Submitted
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Quantum interferences and edge states in Bismuth based Josephson junctions ANIL MURANI, SHAMASHIS SENGUPTA, ALIK KASUMOV, SOPHIE GUERON, HLNE BOUCHIAT, Laboratoire de Physique des Solides, MESO GROUP TEAM — We have investigated proximity induced superconductivity in single crystal bismuth nanowires connected to superconducting electrodes with a high critical field. I will specially report recent results on nanowires whose crystalline orientation could be determined by electron diffraction.

At low temperature a supercurrent is measured which persists up to the critical field of the electrodes and exhibits sample dependent fast squid-like oscillations (period one to few hundred gauss) modulated by slower (few thousand Gauss) oscillations. We attribute this striking result to the appearance of 1D topological edge channels on special surfaces of Bi due to its strong spin-orbit coupling, in addition to a strong Zeeman effect caused by an unusually high g-factor.

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