

SFB 608

Einladung zum Kolloquium

Ort: Universität zu Köln
II. Physikalisches Institut
Seminarraum 201

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Thema: Consequences of Broken Time-Reversal Symmetry in Triplet Josephson Junctions

A rich variety of unconventional Josephson effects have been predicted for junctions combining magnetism and triplet superconductivity. Previous works assume, however, that the properties of the barrier material are independent of the two superconductors. We demonstrate that this assumption fails in a scenario where time-reversal symmetry is broken by the misalignment of the d-vectors of the superconductors on either side of the junction. Remarkably, we find that a magnetic moment can appear at the tunneling barrier, aligned along the direction mutually perpendicular to the two d-vectors. The properties of the junction are radically altered by a finite magnetization of the barrier. In particular, we find that the junction is stabilized in a fractional state, i.e. the free energy minimum lies at a phase difference intermediate between 0 and π . This permits the existence of fractional flux quanta at the junction barrier. Furthermore, the d-vector misalignment results in the appearance of a Josephson spin current.

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