

## **AC Josephson effect in finite-length nanowire junctions with Majorana modes**

**Pablo San-Jose**

Instituto de Estructura de la Materia (CSIC)  
Serrano 123, 28006 Madrid (SPAIN)

### **Abstract:**

It has been predicted that superconducting junctions made with topological nanowires hosting Majorana bound states (MBS) exhibit an anomalous  $4\pi$ -periodic Josephson effect. Finding an experimental setup with these unconventional properties poses, however, a serious challenge: for finite-length wires, the equilibrium supercurrents are always  $2\pi$  periodic as anticrossings of states with the same fermionic parity are possible. We show, however, that the anomaly survives in the transient regime of the ac Josephson effect. Transients are, moreover, protected against decay by quasiparticle poisoning as a consequence of the quantum Zeno effect, which fixes the parity of Majorana qubits. The resulting long-lived ac Josephson transients may be effectively used to detect MBS.

### **Referencia:**

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