

Séminaire AXE 1 - Sciences et Matériaux Quantiques



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Majorana states in Kitaev chains

Majorana bound states (MBS) are quasiparticles with a high potential for applications in quantum computing. The Kitaev model predicts the emergence of these states at the ends of a chain under specific parameter conditions [1]. In experimental realizations, artificial Kitaev chains can be engineered using quantum dot (QD) – superconductor arrays [2,3]. Recently, a minimal two-site version of such a chain has been demonstrated, revealing the possibility of non-topological MBSs appearing at specific points [4].

Characterizing the emergent MBSs is a key challenge in the field, crucial for advancing towards robust quantum applications. In this presentation, I will discuss recent progress in the field and introduce various methods for qualitatively and quantitatively identifying Majorana localization [5-8]. These measurements enable the identification of parameter regimes with high MBS localization, an essential step toward Majorana-based devices in Kitaev chains [9-11].

References

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