

Laser spectroscopy of Ba⁺ ions in liquid he: Towards the detection of Majorana fermion surface state in superfluid ³He-B

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Abstract

We propose an experimental technique that can be applied to search for the Majorana fermion surface state in superfluid ³He-B. Our proposal uses the electron spin of the Ba⁺ ion as a sensitive probe for the surface excitations, that can be manipulated and monitored by the methods of laser spectroscopy. We discuss the advantages and challenges of the proposed experimental approach and present the progress report of our project up to date. © 2013 Springer Science+Business Media New York.

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Keywords

Laser spectroscopy, Majorana fermion, Spin relaxation