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Physical Sciences Seminar

Dark matter search with quantum nondemolition detection of magnons by a superconducting qubit

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Host: Martin Zemlicka (RG Fink)

Abstract: A superconducting qubit is one of the leading physical devices on quantum information processing in 20 years. As applications, there are scalable quantum computer and quantum sensing devices. Here, we propose a new detection scheme of axions through a quantum nondemolition detection of quanta of collective spin excitations, or magnons. As a seminal work of a emeging field, quantum magnonics, the hybrid quantum system between the Kittle mode of magnon and the superconducting qubit is demonstrated. Furthermore, resolving the number of the magnon through the superconducting qubit was done. By using this hybrid quantum device, we obtain an upper limit on the coupling constant between axions and electrons. This is the
rst experimental result using a quantum nondemolition detection method in an axion detector.

Tuesday, July 9, 2019 11:00am - 12:00pm

IST Austria Campus Heinzel Seminar Room / Office Bldg West (I21.EG.101)

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