

## **Axion Quasiparticles for Axion Dark Matter Detection**

*Tuesday, 31 August 2021 17:10 (15)*

It has been suggested that certain antiferromagnetic topological insulators contain axion quasiparticles (AQs), and that such materials could be used to detect axion dark matter (DM). In the first part of this talk we show that one can detect AQs with transmission spectroscopy. The transmission coefficients including material losses are computed by applying appropriate boundary conditions. We show that by comparing our signal calculation to future THz transmission experiments the existence of AQs can be proven. Furthermore, the comparison can be used to fully characterize the material parameters.

In the second part of this talk we show that AQs can be used for axion DM detection. The dispersion relation and boundary conditions permit resonant conversion of axion DM into THz photons. The resonance frequency is tunable with an external B-field. A parameter study for axion DM detection is performed, computing boost amplitudes and bandwidths using realistic material properties including loss. The proposal could allow for detection of axion DM in the mass range between 1 and 10 meV using current and near future technology.

### **Reference to paper (DOI or arXiv)**

<https://arxiv.org/abs/2102.05366>

### **Your gender (free text)**

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