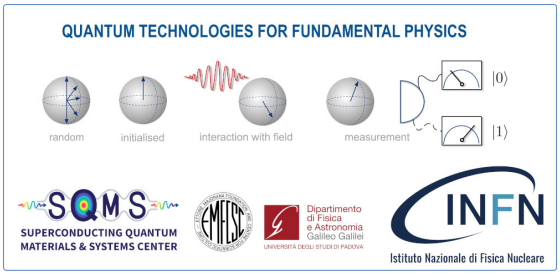

Contribution ID: **41** Type: **not specified**

First Results from BREAD Dark Photon Search

Sunday, September 3, 2023 3:50 PM (20 minutes)

We introduce the Broadband Reflector Experiment for Axion Detection (BREAD) conceptual design and science program. BREAD is a dish antenna experiment based on a coaxial cylindrical reflector design which converts axions or dark photons into ordinary photons and focuses them onto a small sensor. This unique geometry is well matched to the requirements of superconducting quantum sensors since it is compatible with the use of standard cryostats and high-field solenoids. The BREAD technology may be used to search for bosonic dark matter across frequencies ranging from the microwave to visible light, corresponding to masses between ~40 micro-eV to 1 eV. We will show initial results from a dark photon search conducted with a 0.7 m2 reflector at room temperature in the 10-13 GHz frequency range. Sensitivity to the KSVZ and DFSZ axions will require new generations of photon-counting quantum sensors in combination with large reflector areas and high-field magnets. We project BREAD sensitivity for various sensor technologies and discuss future prospects.

Presenter: SONNENSCHEIN, Andrew (Fermilab)

Session Classification: Superconducting cavities, materials, and quantum technology for detection of weakly-coupled particles