

Axion searches based on $Q_0 \approx 10^{10}$ multimode superconducting cavities

Tuesday 9 August 2022 15:03 (3 minutes)

The SQMS Physics and Sensing thrust is working toward the implementation of multiple axion search schemes to improve upon the current state-of-the-art sensitivity. The search schemes here under consideration all utilize either single or multiple ultra-high Q SRF cavities. Rather than applying an external magnetic field, these searches take advantage of the cavity resonant modes to enhance the production and/or detection of axions in the cavity volume. We are actively working on the design of two searches. We are also carrying out multi-mode and single mode non-linearity measurements as part of an experimental feasibility study to gain insight on the behavior of the ultra-high Q resonators and the RF system in the regime relevant for axion searches.

Primary authors: GIACCONE, Bianca (Fermilab); BERLIN, Asher (Fermilab); GONIN, Ivan (Fermilab); Dr GRASSELLINO, Anna (Fermilab); Dr HARNIK, Roni (Fermilab); KAHN, Yoni (Urbana Champaign university); KHABI-BOULLINE, Timergali; LUNIN, Andrei (Fermilab); MELNYCHUK, Alex (Fermilab); NETEPENKO, Alexandr (Fermilab); PILIPENKO, Roman; PISCHALNIKOV, Yuriy (Fermilab); Dr POSEN, Sam; PRONITCHEV, Oleg (Fermilab); Dr ROMANENKO, Alexander (Fermilab); YAKOVLEV, Vyacheslav (Fermilab)

Presenter: Dr POSEN, Sam

Session Classification: Poster Lightning Talks