



Contribution ID: 75

Type: **not specified**

The Dark Matter Radio Suite of Experiments

Thursday, 6 July 2023 10:15 (20 minutes)

DMRadio searches for QCD axions over a broad mass (frequency) range: 0.4neV to $0.8\mu\text{eV}$ (0.1MHz to 200MHz), with sensitivity down to the DFSZ model. To achieve this ambitious goal, DMRadio includes three axion detection experiments: DMRadio-50L is under construction and will begin operation in early 2024. It consists of a toroidal magnet with a superconducting sheath and solenoidal resonator pickup operating from 5kHz to 5MHz . The design of DMRadio-m3 is nearing completion. It consists of a solenoidal magnet with a copper coaxial resonant pickup, and will reach DFSZ from 30 MHz to 200 MHz . DMRadio-GUT is a future experiment to build on experience from both DMRadio-50L and DMRadio-m3. It uses a large detector volume with quantum enhancement to reach DFSZ from 0.1 MHz to 30 MHz . While readout with dc SQUIDS is sufficient for DMRadio-m3, quantum enhanced measurement through radio frequency quantum upconverters will be needed for DMRadio-GUT. To this end, quantum upconverters will be deployed on DMRadio-50L as a testbed for quantum enhancement. Experimental design and projected sensitivities for the DMRadio suite will be presented.

Primary author: LI, Dale (SLAC National Accelerator Laboratory)

Presenter: LI, Dale (SLAC National Accelerator Laboratory)

Session Classification: Thursday Session 1