



Contribution ID: 46

Type: **not specified**

## Axion production and detection using NMR-type experiments

*Thursday 25 September 2025 17:00 (15 minutes)*

Axions that couple to nuclear spins via the axial nuclear moment interaction can be both produced and detected using NMR techniques. The gradient of the radiated axion field is set by the size of the spin-polarized source, which can greatly exceed that of ambient axion dark matter. This sourced axion field can be resonantly detected using NMR and measured with sensitive magnetometers. In this talk, I will present a calculation of the experimental sensitivity. As I will show, a pair of centimeter-scale NMR devices operating over a one-day integration time can already surpass existing astrophysical bounds on the axion-nucleon coupling, including those from star cooling. This setup is capable of probing a wide range of axion masses, up to values comparable to the inverse size of the spin source.

**Author:** YANG, Fengwei (University of Florida & University of Notre Dame)

**Presenter:** YANG, Fengwei (University of Florida & University of Notre Dame)

**Session Classification:** Parallel Sessions Thursday Pheno 2

**Track Classification:** Particle Phenomenology