Contribution ID: **32** Type: **Poster**

Axion-Photon Conversion in Magnetospheres: The Role of the Plasma

Summary

The most promising indirect search for the existence of axion dark matter uses radio telescopes to look for narrow spectral lines generated from the resonant conversion of axions in the magnetospheres of neutron stars. Unfortunately, a large list of theoretical uncertainties has prevented this search strategy from being fully accepted as robust. In this talk I will present a recently end-to-end pipeline based on an auto-differentiable ray-tracing algorithm that allows one assess many of the outstanding uncertainties related to the role of the plasma, including: (1) do refraction and reflection induce strong inhomogeneous features in the flux, (2) can refraction induce premature axion-photon de-phasing, (3) what is the expected width of the line, (4) does the flux have a strong time-dependence, and (5) can these radio photons be efficiently absorbed.

Primary authors: WITTE, Samuel (Grappa, University of Amsterdam); Dr WENIGER, Christoph; Mr NOORDHUIS, Dion (Grappa, UvA); Dr EDWARDS, Thomas (Stockholm U, OKC)

Presenter: WITTE, Samuel (Grappa, University of Amsterdam)