

Photon-axion oscillations with ELMAG

Monday 22 November 2021 12:10 (20 minutes)

ELMAG is a Monte Carlo program made to simulate electromagnetic cascades initiated by high-energy photons interacting with the extragalactic background light. Photons propagating in an external magnetic field may further oscillate into axions or axion-like particles (ALPs). We have implemented axions into ELMAG, complementing thereby the usual description of photon-axion oscillations with a Monte Carlo treatment of high-energy photon propagation and interactions. Such oscillations will lead to characteristic features in the energy spectrum of high-energy photons from astrophysical sources that can be used to probe the existence of ALPs. In this talk, the implementation of axions into ELMAG is discussed. Furthermore, the expected signatures of photon-axion oscillations are reviewed and the importance of a proper treatment of magnetic fields are stressed.

Authors: KACHELRIESS, Michael; Mr TJEMSLAND, Jonas (NTNU)

Presenters: KACHELRIESS, Michael; Mr TJEMSLAND, Jonas (NTNU)

Session Classification: Dark Matter

Track Classification: Dark matter