Contribution ID: **760** Type: **Invited talk in the parallel session**

Constraining dark photons from CMB data

Tuesday, July 6, 2021 10:36 AM (18 minutes)

Photons propagating through the Universe acquire the effective mass that depends on the local density of free charges. This means that if a light new particle that mixes with photons (e.g. dark photon or axions) exists in Nature, photons can be resonantly converted into such particles at numerous places along a typical line of sight. In particular, this can result in specific distortions both in the energy spectrum and small-scale anisotropies in the CMB. Utilizing the results from the EAGLE 100 Mpc simulation, we predict the distribution of the conversion probability over the sky. Comparing these predictions with the brightness temperature measurements of COBE/FIRAS and the CMB anisotropy measurements of Planck and SPT allows us to rule out a significant portion of the parameter space of dark photon. The results are further applied to constrain a proposed model to explain the strength of 21 cm absorption observed by EDGES.

Primary authors: SOKOLENKO, Anastasia (Austrian Academy of Sciences); PRADLER, Josef (Austrian Academy of Sciences); BONDARENKO, Kyrylo (CERN)

Presenter: SOKOLENKO, Anastasia (Austrian Academy of Sciences)

Session Classification: New Horizons in Cosmology with CMB Spectral Distortions

Track Classification: Cosmic Microwave Background: New Horizons in Cosmology with CMB Spectral Distortions