Contribution ID: **48** Type: **not specified**

An SZ-Like Effect on Stochastic Gravitational Wave Backgrounds

Tuesday 27 June 2023 14:40 (20 minutes)

Stochastic gravitational wave backgrounds (SGWBs) are the conglomeration of unresolved gravitational wave signals from the early universe and from astrophysical sources, which make them a promising tool for cosmologists. Because gravitons decouple from the cosmic plasma early on, one can consider interactions between gravitons and any particle species that were present in the very early universe. Analogous to the cosmic microwave background, inverse Compton scattering on any stochastic background will induce small distortions in its energy density spectrum. We then quantify how small these spin dependent spectral distortions are when attributed to the dark matter in the early Universe. In a more general approach, looking at the spin dependent distortion of the SGWB could indicate possible Beyond the Standard Model physics.

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Session Classification: Parallel

Track Classification: Cosmology