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Dark Dresses around Primordial Black Holes: Phenomenological Implications

Wednesday, 19 June 2024 09:20 (20 minutes)

I will discuss the interplay between the phenomenology of primordial black holes and the dark matter searches. I will focus on how a sub-dominant component of PBHs interacts with the bulk of the DM. In particular, I will describe how a DM “mini-halo” is expected to form around PBHs, with relevant phenomenological consequences. The focus will be on two relevant effects. (i) If the bulk of the DM is composed of WIMPs, the mini-halos would shine in gamma rays. Hence, a hypothetical future detection of a sub-dominant component of PBHs could allow to set very stringent constraints on the WIMP annihilation cross section. (ii) The dark mini-halo can significantly alter the accretion rate of baryonic matter. I will discuss this effect and its impact on the CMB bounds, stressing the importance of the accretion model. I will conclude by carefully reassessing the accretion bounds (both astronomical and cosmological) stressing the relevance of the astrophysical uncertainties.

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