Contribution ID: **70** Type: **not specified**

Regular primordial black hole constraint from isotropic gamma- ray background

Monday, 9 September 2024 17:45 (25 minutes)

The literature is flourishing in exotic and theoretical black hole solutions realized in the framework of general relativity or modified gravity theories to cure the singularity affecting the vacuum solutions of general relativity. On the other hand, the Schwarzschild solution is the standard lore when computing constraints on primordial black hole abundance arising from the isotropic diffuse gamma-ray background. In this study, we present an extension of such constraint by considering a sample of the most common regular black hole solution. We show that the constraint changes and the so-called asteroid mass width, where primordial black holes may contribute to the totality of the dark matter, can be enlarged or closed by those non-Schwarzshild solutions.

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