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(WITHDRAWN) Kilometer-scale ultraviolet regulators and astrophysical black holes

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Regular black hole metrics involve a universal, mass-independent regulator that can be up to $O(700\text{ km})$ while remaining consistent with terrestrial tests of Newtonian gravity and astrophysical tests of general relativistic orbits. However, for such large values of the regulator scale the horizon is lost. We solve this problem by proposing mass-dependent regulators. This allows for large, percent-level effects in observables for regular astrophysical black holes. By considering the deflection angle of light and the black hole shadow, we demonstrate the possibility of large observational effects explicitly.

Keyword-1

black holes

Keyword-2

modified gravity

Keyword-3

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