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IceCube constraints on Violation of Equivalence Principle

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We analyze the effects of a Violation of Equivalence Principle (VEP) on neutrino oscillations, focusing on the recently released IceCube data on atmospheric neutrino fluxes. We obtain the strongest constraints up to date on the parameter space of VEP in the context of neutrino physics with a benchmark choice for the coupling between neutrinos and gravitational field. We also study the effect of VEP on the flavor composition of astrophysical neutrinos, stressing the interplay with the basis in which VEP is diagonal. We find that for some choices of such basis the flavor ratio measured by IceCube can probe VEP and we compare with the sensitivities of IceCube-Gen2 as well.

Collaboration name

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