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Suppression of nonperturbative strong field effects in gravity theories[1] FETHI M RAMAZANOGLU, Koc University — A modification to general relativity (GR) is particularly interesting when it deviates from GR slightly in weak gravitational fields and by a large amount in the strong-field regime. The former ensures that known observational bounds are satisfied, and the letter makes the theory relevant for gravitational wave detections, our primary source of information for strong-field gravity, which have limited precision. Spontaneous scalarization scenario in scalar-tensor theories is a well-known example of such a theory, where an additional scalar degree of freedom is the culprit for the deviations from GR. Recent work has shown that other fields such as vectors lead to similar results. We will present our investigation of the natural generalization of these two theories where scalars and vectors are both spontaneously growing. The idea might seem straightforward at first, but the effects of scalars and vectors on gravity are opposite in a mathematically precise sense, hence, their combination can lead to the suppression of deviations from GR. This can have important consequences for the detectability of the modifications of GR using gravitational waves.

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Fethi M Ramazanoglu
Koc University

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