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Constraining spontaneous black hole scalarization with gravitational waves

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Certain scalar-tensor theories remain viable despite stringent observational constraints from the Solar System due to a Z_2 symmetry that keeps the scalar field dormant in the weak-field regime. However, extreme-gravity environments can trigger a phase transition that promotes a spontaneous growth of the scalar field around compact objects like black holes and neutron stars. This is the phenomenon of spontaneous scalarization. In this talk, I will discuss how certain scalar-tensor-Gauss-Bonnet theories, which allow for the spontaneous scalarization of black holes, can be constrained using current gravitational-wave data.

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