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Disformed Kerr metric

I will talk about disformal versions of the Kerr spacetime in higher order scalar tensor theories. Properties of the constricted solutions are rather non-trivial and in many aspects differ from those of the Kerr solution. Although the disformed metric has only a ring singularity and asymptotically is quite similar to Kerr, it is found to be neither Ricci flat nor circular. Non-circularity has far reaching consequences on the structure of the solution. The horizon for the disformed metric does not coincide with the stationary limit of infalling observers, unlike the Kerr case. I will also discuss constraints using the recent measurement of the pericenter precession of the star S2 by the GRAVITY Collaboration, and a possibility to probe these Kerr deformations in future experiments.

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