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(G*) Marginally Outer Trapped (Open) Surfaces in Rotating 5D Black Holes

Monday 6 June 2022 16:30 (15 minutes)

In astrophysically realistic black holes –for instance, binary black hole mergers –the surface of most obvious interest is the Event Horizon. However, this surface is often computationally difficult to locate due to its global definition. Instead, it is useful to turn to quasi-local characterizations of black hole boundaries, such as Marginally Outer Trapped Surfaces (MOTS), which have the benefit of being defined for a single time slice in a spacetime, while the outermost of which is also (generally) the apparent horizon. My talk, which was the subject of my master's thesis, will describe work which seeks to understand MOTS in the interior of five-dimensional black holes; in particular, I will focus on our results in studying the rotating case (Myers-Perry). Similar to the four-dimensional Schwarzschild case studied by my collaborators, and the five-dimensional static case I presented last year at CAP, we find self-intersecting MOTS, and in doing so provide further support for the claim that self-intersecting behaviour is rather generic. I will conclude by discussing new oscillating MOTS-like surfaces, first seen in this study of 5D rotating black holes, and now reproduced for other types of rotating black holes in other dimensions.

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