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On the stability operator for MOTS and the 'core' of Black Holes

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I will consider small deformations of marginally (outer) trapped surfaces (MOTS) by using the stability operator introduced by Andersson-Mars-Simon. In the case of spherical symmetry, one can use these deformations on any marginally trapped round sphere placed at the spherically symmetric marginally trapped tube (MTT) -defined by $r = 2m$- to prove several interesting results as well as the following surprising and fundamental theorem: "In spherically symmetric spacetimes, there are closed trapped surfaces (topological spheres) penetrating both sides of the spherical (non-null) MTT with arbitrarily small portions inside the region $r < 2m$".
Then, the concept of 'core' of a black hole is introduced: it is the minimal region that one should remove from the spacetime in order to get rid of all possible closed trapped surfaces. In spherical symmetry, and using the previous theorem, one can prove that the spherical MTT is the boundary of a core.
By using a novel formula for the principal eigenvalue of the stability operator, I will argue that similar results may hold in general black hole spacetimes.