Stress-energy Tensor for a Quantized Scalar Field When a Black Hole in Four Dimensions Forms From the Collapse of a Null Shell[1]
SHOHREH GHOLIZADEH SIAHMAZGI, PAUL R. ANDERSON, RAYMOND D. CLARK, Wake Forest University, ALESSANDRO FABBRI, Universidad de Valencia-CSIC and Université Paris-Saclay — A method has been developed to compute the stress-energy tensor for a quantized massless minimally coupled scalar field in a spacetime where a black hole forms from the collapse of a spherically symmetric null shell in four dimensions. This method involves taking the difference between the stress-energy tensor for the "in" state in the collapsing null shell spacetime and that for the Unruh state in the Schwarzschild spacetime. The construction of the modes that define the in-vacuum state and Unruh state will be discussed. Two different checks on the construction of the modes for the "in" state will be presented and the numerical computation of the stress-energy tensor will be discussed.

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