

Abstract Submitted
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Stress Tensor from the Trace Anomaly in Black Hole Spacetimes.

RUSLAN VAULIN, University of Wisconsin Milwaukee, PAUL ANDERSON, Wake Forest University, EMIL MOTTOLA, Los Alamos National Laboratory — We compute the expectation value of the quantum stress tensor for conformal matter fields from the trace anomaly, in Schwarzschild and Reissner-Nordstrom spacetimes. We show that the two scalar auxiliary fields associated with the anomaly can be adjusted to obtain finite stress tensors on the Reissner-Nordstrom event horizon, including in the extreme $Q=M$ case. We compare this result to other analytic approximation methods which predict an infinite stress tensor on the horizon, and existing numerical results. The classical stress tensor of the auxiliary fields associated with the anomaly gives a general approximation for the renormalized quantum stress tensor in qualitative agreement with numerical evaluations in the vicinity of all Reissner-Nordstrom horizons.

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