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A Little Excitement Across the Horizon

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I report on the results of the first analysis of a time-and-space localised quantum system crossing the horizon of a (3+1)-dimensional black hole. We analyse numerically the transitions in an Unruh-DeWitt detector, coupled linearly to a massless scalar field, in radial infall toward a (3+1)-dimensional Schwarzschild black hole. In the Hartle-Hawking and Unruh states, the transition probability attains a small local extremum near the horizon-crossing and is then moderately enhanced on approaching the singularity. In the Boulware state, the transition probability drops on approaching the horizon.

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