LATTICE 21

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Real time dynamics of a semiclassical gravitational collapse of a scalar quantum field.

Tuesday, 27 July 2021 14:00 (15 minutes)

We present a new method to numerically investigate the gravitational collapse of a free, massless scalar quantum field in the semiclassical approximation from a spherically symmetric, coherent initial state. Numerical results are presented for a small ($r_s = 3.5 l_p$) wave packet in the l=0 approximation. We observe evidence for the formation of a horizon and study various systematic effects such as finite volume, time and radial discretization, different waveforms and vacuum subtraction procedures. Within our approximation, we find that the onset of the horizon formation is accelerated by semiclassical effects. Prospects for including higher angular momentum states and observing Hawking radiation are discussed.

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