

# The effect of Hawking radiation on blackhole catalyzed phase transition

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It has been discussed by Gregory et al. that small blackholes would catalyze vacuum phase transitions. We investigate such phase transition including the (inhomogeneous) thermal effect of Hawking radiation and calculate the bounce action numerically. I will show that the transition rate can be slightly suppressed by the thermal effect of Hawking radiation. I will also mention an application to the catalyzed phase transition associated with the Higgs metastability and conclude that the thermal effect may be negligible for the catalyst effect in the Higgs metastability, in contrast to the previous estimation without backreaction on spacetime metric. This means that if the Higgs metastability is true, the blackhole catalyst effect would be indeed catastrophic for our Universe.

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