A note on the influence of the cosmological constant on the maximum entropy of a black hole

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Abstract

A significant consequence of the non-Gaussianity of the cosmological constant has been noticed. It is known that the maximum entropy of a black hole is the maximum entropy for a spatially flat black hole. This result does not hold in case a black hole is distorted, hence the black hole is not maximally thermodynamically stable. However, it holds for the cosmological constant as well. The maximum entropy of a black hole depends on the cosmological constant. For the minimal $U(1)$ cosmological constant, the maximum entropy is always, irrespective of the cosmological constant, the maximum entropy.