Abstract

The entropy-area relation of black holes is one of the important results of theoretical physics. It is one of the few relations that is used to test theories of quantum gravity in the absence of any experimental evidence. It states that $4 \times \ell_P^2$ is the fundamental area that holds *one* bit of information. Consequently, a question arises: why $4 \times \ell_P^2$ and not $1 \times \ell_P^2$ is the fundamental holder of *one* bit of information? In any case it seems the latter choice is more natural. We show that this question can be answered with a more explicit counting of the independent states of a black hole. To do this we introduce a method of counting which we name self-relative information. It says that a bit alone does not have any information unless it is considered near other bits. Utilizing this approach we obtain the correct entropy-area relation for black holes with $1 \times \ell_P^2$ as the fundamental holder of *one* bit of information. This method also predicts, naturally, the existence of logarithmic corrections to the entropy-area relation.