

Entropy, entanglement and information in black hole evaporation

ANA ALONSO-SERRANO

Institute of Theoretical Physics, Faculty of Mathematics and Physics, Charles University, 18000 Prague, Czech Republic
a.alonso.serrano@utf.mff.cuni.cz

May 10, 2017

ABSTRACT

It can be found that blackbody radiation contains (on average) an entropy of 3.9 ± 2.5 bits per photon. The flip side of this observation is the information budget: If the emission process is unitary, as it certainly is for normal physical burning, then this entropy is exactly compensated by the “hidden information” in the correlations that we choose not to consider within the specific coarse-graining. We can also extend this argument to the Hawking radiation from black holes, demonstrating that the assumption of unitarity leads to a perfectly reasonable entropy/information budget.