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Hawking-Bekenstein temperature and entropy from uncertainty principle

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We give an alternative way for deducing the Hawking-Bekenstein black hole temperature and entropy by using the Heisenberg uncertainty principle. We consider as known the black hole mass as M and consequently its energy. Quantities as temperature T and entropy S can be found under the hypothesis that incoming radiation and matter leads to a thermodynamic equilibrium state. Obviously this is not seen by an external observer, who may know only the horizon temperature T´. The results are obtained theoretically, by using the convergence of general relativity, thermodynamics and quantum mechanics. We start by assuming small black holes, although the resulting equations have a more general validity. It can be shown that reciprocally, starting from the Hawking-Bekenstein temperature, uncertainty relation equations can be obtained. Examples are given for small and large blackhole masses.

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