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The probability distribution for the work performed by a rotating wave on a two-level system

We consider the probability distribution for the work performed on an initially thermalised two-level system by a rotating wave (Rabi problem). It is simpler to compute the associated characteristic function, after which we can obtain an expression for the probability distribution. This distribution is shown to obey Crooks' theorem (and Jarzynski's equality). Furthermore, using the expression for the characteristic function and applying an inverse Laplace transformation, one is also able to compute the characteristic function of the probability distribution for the work performed by a rotating wave in an isolated two-level system. The probability distribution of the work performed is also shown to obey the micro-canonical version of Crooks' theorem. A short introduction to the overall thematic surrounding the Jarzynski's equality will be given in this talk and possible experimental applications of our result are briefly discussed at the end.

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