

EQUILIBRIUM AND ENERGY

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Abstract: In this paper it is shown that the equilibrium measure ν for a compact K in potential theory can be related with a unique invariant measure π for a discrete time Markov process by the formula $\pi(dy) = \varphi(y)\nu(dy)$. The chain has the transition function $L(x, A)$, where L is the last-exit kernel in [1]. For a general non-symmetric potential density u the modified energy $I(\lambda) = \int \int \lambda(dx)u(x, y)\varphi(y)^{-1}\lambda(dy)$ and the Gauss quadratic $G(\lambda) = I(\lambda) - 2\lambda(K)$ are introduced. Then G is minimized by π among all signed measures λ on K of finite modified energy, provided I is positive. This includes the classical symmetric case of Newtonian and M. Riesz potentials as a special case. The modification corresponds to a time change for the underlying Markov process. The positivity of I is established for a class of signed measures associated with continuous additive functionals in the sense of Revuz.

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