

# Canonical and microcanonical ensemble descriptions of thermal pairing in nuclei

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We propose a description of pairing properties in finite systems within the canonical and microcanonical ensembles. The approach is derived by solving the BCS and self-consistent quasiparticle random-phase approximation with the Lipkin-Nogami particle-number projection at zero temperature [1, 2]. The obtained eigenvalues are embedded into the canonical and microcanonical ensembles. The results obtained are found in quite good agreement with the exact solutions of the doubly-folded equidistant multilevel pairing model as well as the experimental data for <sup>56</sup>Fe nucleus [3]. The merit of the present approach resides in its simplicity and its application to a wider range of particle number, where the exact solution is impracticable.

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