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Thermodynamics of Pairing in the Mesoscopic Nuclear System[1]
TONY SUMARYADA, ALEXANDER VOLYA, Florida State University — We present a systematic study of the thermodynamic properties of pairing correlation in mesoscopic nuclear system. The realistic and model Hamiltonians are used in this study. Various thermodynamic quantities are calculated and analyzed using the exact solution of pairing. We conduct an in-depth comparison of microcanonical, canonical and grand canonical approaches. The nature of the pairing phase transition in small system is of a particular interest. We discuss the onset of discontinuity in thermodynamic variables, fluctuations, and evolution of zeros of the partition function in the complex temperature plane associated with the transition to a superconducting phase.

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