Itinerant ferromagnetism in fermionic systems with $SP(2N)$ symmetry WANG YANG, CONGJUN WU, University of California San Diego — The Ginzburg-Landau free energy of systems with $SP(2N)$ symmetry describes a second order phase transition on the mean field level, since the Casimir invariants of the $SP(2N)$ group can be only of even order combinations of the generators of the $SP(2N)$ group. This is in contrast with systems having the $SU(N)$ symmetry, where the allowance of cubic term generally makes the phase transition into first order. In this work, we consider the Hertz-Millis type itinerant ferromagnetism in an interacting fermionic system with $SP(2N)$ symmetry, where the ferromagnetic orders are enriched by the multi-component nature of the system. The quantum criticality is discussed near the second order phase transition point.

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