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Spin conservation and Fermi liquid near a Pomeranchuk transition ANDREY CHUBUKOV, University of Wisconsin, DMITRII MASLOV, University of Florida — We analyze system behavior near a Pomeranchuk instability in terms of Fermi liquid theory. We argue that the original assumption that a single Landau parameter approaches -1 at a Pomeranchuk transition, while others are non-critical is incorrect in $D \leq 3$. We show that, near the transition, a system enters into a novel regime in which all other Landau components increase and eventually diverge at the critical point. We demonstrate that in this novel regime the relation between the Landau function and the full vertex is different from that in a conventional Fermi liquid theory – the proportionality factor no longer contains the running effective mass and has the same constant value as at the boundary between a conventional Fermi liquid and the novel Fermi liquid behavior. We show how to restore spin conservation near a Pomeranchuk transition and discuss extra features specific to Pomeranchuk instabilities in the spin channel.

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