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Variational and Parquet-diagram Calculations for Neutron Matter. III. S-wave Pairing JIAWEI WANG, ECKHARD KROTSCHECK, State Univ of NY - Buffalo — We apply parquet-diagram summation methods for the calculation of the superfluid gap in S-wave pairing in neutron matter for realistic nucleon-nucleon interactions such as the Argonne v_6 and the Reid v_6 potentials. It is shown that diagrammatic contributions that are outside the parquet class play an important role. These are, in variational theories, identified as so-called "commutator contributions". Moreover, using a particle-hole propagator appropriate for a superfluid system results in the suppression of the spin-channel contribution to the induced interaction. Applying these corrections to the pairing interaction, our results agree quite well with Quantum Monte Carlo data.

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