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Calculation of the tensor components of the kinetic coefficients of arbitrarily degenerate electrons in the neutron star crust.

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Analytical expressions are obtained for four tensors of kinetic coefficients from the solution of the Boltzmann equation by the Chapman-Enskog method in the 3-polynomial approximation, taking into account electron-electron collisions for the case of nondegenerate electrons in a magnetic field.
For strongly degenerate electrons, asymptotically accurate analytical expressions for the thermal conductivity tensor, thermo-diffusion, diffusion, and diffusion thermal effect in the Lorentz approximation are obtained for the first time, taking into account the magnetic field. This solution has a much more complex dependence on the magnetic field than the dependencies in previous publications.
For the special case of partial degeneracy at $\epsilon_f/kT = 1.011$, analytical expressions for the kinetic coefficients in the absence of a magnetic field are obtained from the solution of the Boltzmann equation in the 3-polynomial approximation. It is shown that the convergence of the polynomial approximation to the exact value is slower than for non-degenerate electrons.

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