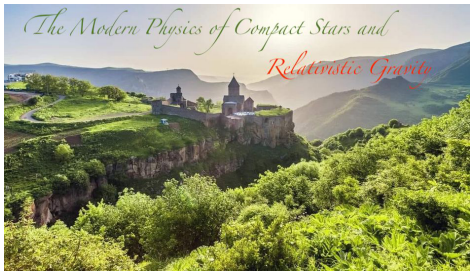

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Calculation of the kinetic coefficients of arbitrary degenerate electrons in magnetized dense matter

Tuesday 28 September 2021 12:35 (25 minutes)

Analytical expressions for the components of the tensors of thermal conductivity, diffusion, thermal diffusion and the diffusional thermal effect are obtained from the solution of the Boltzmann equation by the Chapman-Enskog method, taking into account electron-electron collisions for the case of non-degenerate electrons in a magnetic field. For strongly degenerate electrons, asymptotically accurate analytical expressions are obtained for the tensors of kinetic coefficients in the Lorentz approximation, taking into account the magnetic field. For the case of partial degeneracy at □□ / □□ =1.011, the 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.The calculations of the transfer coefficients allow us to estimate the influence of the magnetic field on the transfer of heat and charge in the dense regions of neutron stars and white dwarfs. The obtained expressions can also be used to describe the transfer coefficients in other magnetized objects containing free arbitrarily degenerate electrons.

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