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Investigation of electron transport properties of two-temperature Argon-Helium thermal plasma ROHIT SHARMA, Satyam Institute of Engineering and Technology Amritsar -143107, India, KULDIP SINGH, Department of Physics, Guru Nanak Dev University Amritsar -143005, India — In the present work, two cases of thermal plasma have been considered; the ground state plasma in which all the atoms and ions are assumed to be in the ground state and the excited state plasma in which atoms and ions are distributed over various possible excited states. Electron transport properties (electrical conductivity and electron thermal conductivity) of argon-helium (25-75%) thermal plasma mixture have been studied within the framework of Chapman-Enskog method in temperature range from 5000K to 40000K at pressure p=5 atm for both the ground state (GS) and excited state (ES) cases. The influence of electronic excitation and non-equilibrium parameter $\theta = T_e/T_h$ has been examined on higher-order contribution to electrical conductivity and electron thermal conductivity. It is observed that higher-order contributions of these transport properties are affected by both the non-equilibrium parameter θ and inclusion of electronically excited states (EES).

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