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Thermodynamic properties of a scalar charged boson gas in presence of an external magnetic field

We study the thermodynamic properties of a relativistic magnetized scalar charged boson gas at any temperature in the presence of an external magnetic field. We reproduce the low temperature behavior of the boson gas characterized by two plateus of specific heat the first one at 1/2, the reduction on one dimensional gas due to the strong magnetic field provokes that all the bosons are in the lowest Landau level (LLL) and the second at 3/2 when the temperature is higher than the magnetic field and the system recover a 3D behavior.We have obtained the EoS of the gas and we analyze the effect of temperature and magnetic field and the role of antiparticles in the behaviour of thermodynamic magnitudes. Astrophysical implications are discussed.

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