

Abstract Submitted
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Nonextensive Thomas-Fermi model BHIMSEN SHIVAMOGGI, EVGENY MARTINENKO, University of Central Florida — Nonextensive Thomas-Fermi model was further investigated in the following directions: Heavy atom in strong magnetic field. Following Shivamoggi work on the extension of Kadomtsev equation we applied nonextensive formalism to further generalize TF model for the very strong magnetic fields (of order 10^{12} G). The generalized TF equation and the binding energy of atom were calculated which contain a new nonextensive term dominating the classical one. The binding energy of a heavy atom was also evaluated. Thomas-Fermi equations in N dimensions which is technically the same as in Shivamoggi (1998), but behavior is different and in interesting 2D case nonextensivity prevents from becoming linear ODE as in classical case. Effect of nonextensivity on dielectrical screening reveals itself in the reduction of the envelope radius. It was shown that nonextensivity in each case is responsible for new term dominating classical thermal correction term by order of magnitude, which is vanishing in a limit $q \rightarrow 1$. Therefore it appears that nonextensive term is ubiquitous for a wide range of systems and further work is needed to understand the origin of it.

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