Abstract Submitted
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Debye Layers in Plasmas Generalized to Hadron Confinement of Nuclei and Quark-Gluon-Plasmas HEINRICH HORA, Univ. New South Wales, Sydney, Australia, GEORGE H. MILEY, Univ. Illinois, Urbana, IL — .A new theory for the nuclear forces for confining the hadrons in a nucleus has been derived from a generalization of the Debye layer as known from the plasma ablation at laser irradiation where the temperature is substituted by the Fermi energy of the nucleons [1]. The first convincing proof is by using the empirical density of the nucleons defining their Fermi energy to arrive at a Debye length of about 3 fm as measured by Hofstadter for the decay of the nucleon density at the surface of heavy nuclei. This decay is interpreted as Wigner scattering and the Goos-Haenchen effect. With the same steps of substitutions, the surface energy of nuclei is always too small against the nucleon enthalpy to confine the hadrons until the density reaches such high values reproducing the empirical known radii of nuclei. By this way nuclei are possible only until uranium or curium by a Boltzmann equilibrium process explaining the endothermic generation of heavy nuclei in the Universe [2]. At and about six times higher nucleon density, the Fermi statistics changes into its relativistic branch excluding nucleation in neutron stars and explaining the quark-gluon plasma. [1] *Edward Teller Lectures*, H. Hora and G.H. Miley eds. (Imperial College Press London 2005) p. 103. [2] H. Hora, G.H. Miley, F. Osman, Astrophysics and Space Science, **298**, 247 (2005)

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