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The extended nuclear matter model with smooth transition surface JORGE RUEDA, BARBARA PATRICELLI, MICHAEL ROTONDO, REMO RUFFINI, ICRANet and University of Rome "Sapienza" — The existence of electric fields close to their critical value $E_c=(m_e c^3)/(e\hbar)$ has been proved for massive cores of 10^7 up to 10^{57} nucleons using a distribution of constant nuclear density and a sharp step function at its boundary. We explore the modifications of this effect by considering a smoother density profile with a proton distribution fulfilling a Wood-Saxon dependence. The occurrence of a critical field has been confirmed. We discuss how the location of the maximum of the electric field as well as its magnitude is modified by the smoother distribution.

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