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Critical nucleus charge in a superstrong magnetic field

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Due to strong enhancement of loop effects in a superstrong magnetic field ($B \gg m^2/e^3$) the Coulomb potential becomes screened. This phenomenon dramatically changes the dependence of the electron energy levels on magnetic field. In particular, the freezing of energy levels occurs so the ground energy level of light ions can never reach the lower continuum (become critical), no matter how strong the field is.

Therefore, the magnetic field affects the critical nucleus charge Z_{cr} in two ways: i. it makes the electron movement essentially one-dimensional diminishing the value of Z_{cr} ; ii. it makes the potential weaker increasing the value of critical charge.

Topic:

Memorial session for W. Greiner

Summary

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