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Functional Approach to Treat the Equation of State of a Dense System of Fermions in a Uniform Magnetic Field[1] ISRAEL PORTILLO VAZQUEZ, EFRAIN FERRER, University of Texas at El Paso — Over the years, many works have been dedicated to the effects of magnetic fields in neutron stars and in quark stars. However, in general, when finding the field- dependent contributions to the energy density and pressures, they did not follow a unique and consistent scheme. Different authors have different stands on what should be the correct field contributions to the pressure and energy. The main purpose of this work is to develop a systematic and self-consistent functional method approach to treat the equation of state of a system of fermions in a uniform magnetic field at finite density and zero temperature. We show that the breaking of the O(3) rotational symmetry by the magnetic field results in a pressure anisotropy, which leads to the distinction between longitudinal- and transverse-to-the-field pressures. It is analyzed under what conditions this anisotropy becomes significant. We present a graphical representation of the field-dependent anisotropic equation of state of the fermion system.

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