Title: New facts about nuclear density functional calculations

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Abstract:
Because of the history of the subject (Skyrme forces, Kohn-Sham theorem), NDFT calculations amount to
Hartree-Fock or Hartree-Bogoliubov calculations using effective forces. They most often provide
deformed solutions.
The present talk shows a first result, surprising, namely that the energy minimization can always be obtained
from spherical solutions. NDFT can therefore be treated rigorously as a one-dimensional theory with radial
density profiles.
A second result, surprising as well, is that concavity is a necessary property of energy surfaces obtained
rigorously by calculations under constraints. No saddle points! Only if every constraint operator Q is accompanied by an additional constraint for Q^2 can one obtain a rigorous theory where fluctuations ΔQ can be kept reasonably constant and concavity removed for a proper quality of the energy surface.