Fig. 7. The residual deviations between measured and calculated masses when the shape-dependent Droplet Model is used for the macroscopic part (upper part) and when the present Thomas-Fermi model is used (lower part). Lines connect isotopes of a given element.

Fig. 8. One octant of the three-dimensional lattice used to solve numerically the Euler-Lagrange equations for saddle shapes. Here the neutron density for the saddle shape of ^{229}Np is depicted by displaying at each lattice point a small sphere whose radius is proportional to the local density there. (From [21].)

Fig. 9. Illustration of the saddle-point shapes for ^{166}Yb, ^{194}Hg, and ^{229}Np calculated in [21]. The upper part is a three-dimensional rendering and the lower parts are contour plots of the neutron density ρ_n corresponding to $\rho_n/(\frac{1}{2}\rho_0) = 0.2, 0.4, 0.6, 0.8, 1.0$.

Fig. 10. Deformation energies for five nuclei calculated in [21]. The constraint parameter Δ is half the distance between the centers of mass of the two halves of the nuclear shape, less its value for the spherical configuration. The current calculations are qualitatively similar, but the calculated fission barrier heights are now in much better agreement with measurements.

Fig. 11. Thirty-six calculated fission barrier heights from ^{173}Lu to ^{252}Cf (open diamonds) are compared with measurements corrected for ground-state shell effects (squares). The triangles show the difference. The "fissility" was chosen as $(Z^2/A)/(1-2.2\,I^2)$, where the coefficient 2.2 multiplying the square of the relative neutron excess I was adjusted to make the calculated points conform closely to a single curve.

Fig. 12. This is like Fig. 11, but the calculations were continued all the way down to ^{8}Be at "fissility" = 2. The other calculated points below fissility = 30 are for ^{20}Ne, ^{40}Ca, ^{75}Br, ^{94}Mo, ^{132}Ba, and ^{160}Dy. Here, and in Fig. 11, a parameter set with $r_0 = 1.145$ rather than $r_0 = 1.14$ was used. With the canonical set based on $r_0 = 1.14$, the barrier for ^{252}Cf would be 0.19 MeV higher and for ^{173}Lu 0.41 MeV higher.