

Joint seminar of the NPI of the CAS

30. 5. 2024

František Knapp (from FMP): Collective vibrations and giant resonances in atomic nuclei

Abstract:

In the traditional microscopic picture, the atomic nucleus is modeled as a self-bound system consisting of strongly interacting point-like nonrelativistic nucleons. Besides the single-particle features, an inherent attribute of practically all nuclei is the existence of collective excitations, formed as a coherent action of many nucleons. Representative examples are low-energy vibrations and giant resonances. Although we understand the microscopic origin of collective modes, a precise quantitative description of such excitations in nuclei is demanding. I will review a few examples of nuclear collective motion and explain the essential ideas used in their theoretical modeling.