

In this bachelor work phase transitions in atomic nuclei are studied. The main attention is paid to quantal phase transitions between nuclear ground states of different symmetry. First, the interacting boson model in its simplest version, IBM-1, is introduced. The correspondence between the IBM and the geometric model of nuclei is indicated and possible shapes of the nucleus in the ground state are introduced. In the next step, critical and degenerated critical points of the potential derived from the IBM-1 are investigated in detail, especially their dependence on parameter values of the potential. Degenerated critical points are classified using the catastrophe theory. The special values of potential parameters are found for which phase transitions of the first and second order occur. Finally, the possibility of substitution of the potential by canonical catastrophic functions in a vicinity of degenerated critical points is discussed.