
STRENGTH FUNCTIONS FROM LARGE SCALE SHELL MODEL AND THEIR APPLICATIONS IN NUCLEAR ASTROPHYSICS

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The configuration interaction method (CI), known in nuclear structure as the large scale shell model, is the optimal tool to study the physics of exotic nuclei far from stability. It is currently the most precise model available in the nuclear structure calculations and the insight into experimental observation without it is hardly possible. In addition to a detailed study of spectroscopic properties of nuclei, CI can be as well used to obtain strength distributions of electromagnetic, Gamow-Teller or First-Forbidden beta-decay operators. In this talk, I will discuss several examples of such CI calculations of interest for nuclear astrophysics, e.g. the impact of microscopically derived strength functions in the neutron-capture rates calculations, recent CI results for half-lives of r-process waiting point nuclei or gamma excitation functions calculations in mass $A=40$ region.