

β -decay fast-timing study of ^{138}Xe

Measurements of nuclear level half-lives provide direct insight into the nuclear structure, as they allow to extract essential information about transition matrix elements. This way, predictions of nuclear structure models can be verified, which is of great importance for investigation of the structure of nuclei located at double shell closures, particularly those with large neutron excess.

We have measured the half-lives of the low-lying states in ^{138}Xe populated in the β decay of ^{138}I . The nucleus ^{138}Xe belongs to a class of nuclei positioned in a close vicinity to the doubly-magic ^{132}Sn , which is characterized by a crossing of the major neutron ($N=82$) and proton ($Z=50$) shell closures. The experiment was performed at the OSIRIS fission-product mass separator at Studsvik in Sweden. The advanced time-delayed β - γ - $\gamma(t)$ method was employed ensuring picoseconds precision. Timing information was obtained from β - $\gamma(t)$ delayed coincidences between events registered in β detector and BaF2 scintillator. We present preliminary results and provide discussion about reduced transition probabilities.

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Track Classification: Experimental Nuclear Physics