Contribution ID: **35** Type: **not specified**

Coulomb excitation in neutron-rich isotopes around Ni

Thursday, 11 April 2019 12:00 (15 minutes)

A main focus of nuclear physics nowadays is the study of the evolution of shell structure in exotic isotopes. An interesting region of the nuclear chart to test shell evolution is around the Ni isotopic chain. For this chain, $B(E2;\ 0^+_{\mathrm{g.s.}} \rightarrow 2^+_1)$ measurements have shown a behavior that differs, not only from the seniority scheme, but also from different theoretical models available, and represents a puzzling situation. In the same region, the study of transition probabilities of low-lying states on odd-A Cu isotopes has produced interesting results on the structure of these states and its collective or single-particle nature. For the odd-mass Co isotopes, which corresponds to the hole-core configuration, very little information on the energy or transition probabilities of the excited states is known. For the Fe isotopes, $B(E2;\ 0^+_{\mathrm{g.s.}} \rightarrow 2^+_1)$ values have been measured up to ^{68}Fe, and an effective lifetime measurement of the 2^+_1 state of ^{70}Fe was recently reported, showing the deformation of these isotopes and outlining the evolution of collectivity between $N = 40$ and $N = 50$.

A proposal to measure the $B(E2;\ 0^+_{\mathrm{g.s.}} \rightarrow 2^+_1)$ values of ^{70,72,74,76}Ni was presented at the last NP-PAC of the RIBF, which graded it as deferred. We aim to re-propose the cases of ^{70,72,74}Ni using the HR-Ge array at RIBF, while the measurement of ^{74,76}Ni are to be performed using DALI2$^+$. The experiment considers a ^{238}U beam at 345 MeV/u impinging on a Be target to produce the isotopes of interest, which are then separated using the BigRIPS spectrometer. Three magnetic settings are considered to populate the isotopes of interest. A secondary Au target is used to induce Coulomb excitation and the HR-array of RIBF will be used to detect the γ-rays emitted after the reaction. Outgoing particles are identified with the ZeroDegree spectrometer. Thanks to the HR-Ge array, within the same experimental settings, further information can be extracted from the analysis of the odd$-A$ Cu and Co isotopes, as well as on odd-even and even-even Fe isotopes.

Primary author: CORTES, Martha Liliana (RIKEN Nishina Center)

Presenter: CORTES, Martha Liliana (RIKEN Nishina Center)

Session Classification: Proposals