Spectroscopy of neutron-rich Fe isotopes studied in the ^{70}Zn+^{238}U reaction.

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The region of nuclei around 68Ni is interesting from the point of view of nuclear structure due to the presence of shape coexistence at low excitation energy, and to the role of intruder shell model configurations. leading to a new island of inversion centered in N=40 ^{64}Cr [1]. Understanding the N=40 island of inversion requires experimental information of neutron-rich Fe isotopes (Z=26).

The study of neutron-rich Fe isotopes is critical in order to understand the N=40 island of inversion, as they represent the border between the spherical and deformed configurations. The neutron-rich Fe isotopes were studied through multinucleon transfer reactions by bombarding a ^{238}U target with a 460 MeV ^{70}Zn beam at LNL [2]. Unambiguous identification of prompt γ-rays belonging to each nucleus was achieved using coincidence relationships with the ions detected in the high-acceptance magnetic spectrometer PRISMA [4] and the CLARA γ-ray spectrometer [5].

This reaction mentioned above, allowed to reach more neutron-rich isotopes, in comparison with previous reaction studies, being possible to identify for the first time up to the 6^+ yrast states in 66Fe, as well as new transitions in the more exotic ^{67,68}Fe isotopes. In this contribution, we will present new information on the excited structure of odd and even mass Fe isotopes from A=62 to 68. This new data will be interpreted with new large-scale shell-model calculations in the *fpgd* model space.

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