In the present contribution we report on the progress in the analysis of the population and $\gamma$-decay of n-rich nuclei around $^{48}$Ca, measured using deep-inelastic collisions. The experiment was performed at LNL in 2007, using a $^{48}$Ca beam at 270 MeV on a $^{64}$Ni target, approximately 1 mg/cm$^2$ thick [1]. The experimental setup consisted of the CLARA Ge array coupled to the PRISMA magnetic spectrometer [2]. These high energy collisions (~2.5 times above the Coulomb barrier) are proved to be a powerful tool for the production of nuclei far from stability. In this connection a good understanding of the reaction mechanisms is a starting point for extracting nuclear structure information. In fact, they provide information on basic physical quantities, such as potentials, spectroscopic factors, particle-vibration coupling and pair transfer. The analysis of the data set is mostly concentrated on a detailed investigation of the reaction properties: angular distributions for pure elastic scattering and for the inelastic excitation of the first excited states of target and projectile have been obtained, as shown in the bottom part of the figure 1. In addition, total cross sections of the most relevant transfer channels have been extracted, as shown in the top panels of the figure. The experimental results have been preliminarily compared with predictions from the semiclassical multi-nucleon transfer model of ref. [2], which is found to well reproduce the data corresponding to (-1p) and (+1p) channels. In addition, for some of the most intense channels, energy integrated angular distributions are also obtained. Finally, for some one-nucleon transfer channels it has been possible to extract the angular distributions of the first excited state.

A preliminary analysis of the $\gamma$-spectra measured by the CLARA array in coincidence with some of the most intense reaction products has also been performed. In several cases (as for example $^{46}$Sc, $^{48}$Ca, $^{49}$Ca and $^{50}$Ca) apart from the strong peaks already observed in deep-inelastic heavy-ion reactions with thick targets and lower incident beam energies [3], additional transitions are visible, previously observed in transfer reactions with light ions only [4]. This is mostly caused by the very short lifetimes of the corresponding states which leads to deexciting transitions emitted in-flight.

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