Study of neutron-rich nuclei in a Radioactive Beam Facility.

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Multinucleon-transfer and deep-inelastic reactions have been used successfully in the last two decades to study the structure of nuclei far from stability in the neutron-rich side of the nuclear chart. Rather good results [1] have been obtained in the past using γ-ray arrays like GASP, EUROBALL, GAMMASPHERE, etc. As a result of the interest in studying nuclei further away from the stability line, new state-of-the-art detection systems have been developed (or are being under development) to identify new γ-ray transitions from those reaction products far away from the stability line. Some of these experimental apparatus are: the CLARA-PRISMA setup [2], the VAMOS-EXOGAM setup [3,4], the AGATA array [5], the ancillary DANTE array [6], etc. A futher effort to push our knowledge towards the neutron drip-line, is the development of Radioactive Ion Beam Facilities like, SPIRAL 2. These kind of facilities will broad the physics opportunities, and ancillary detectors will become essential, among other capabilities, to reduce the background from radioactivity or to reveal the kinematics of the reaction to apply Doppler correction of the emitted γ rays.

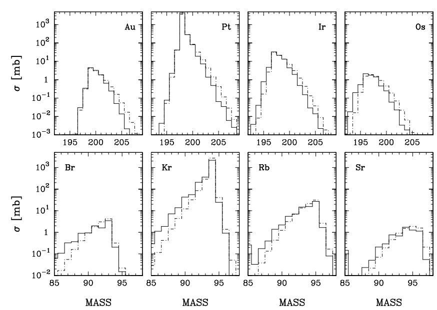

Figure 1: Total angle and Q-value integrated cross sections for the target-like fragments (top pannel) and the beam-like fragments (bottom pannel) of the ^{94}Kr+^{198}Pt reaction at 450 MeV. The dashed lines are the results of the GRAZING [7] calculations without neutron evaporation, while the solid lines include neutron evaporation.

It is our aim during the *RNB7 International Conferenze* to discuss: i) the performance figures for the current set-ups, CLARA-PRISMA and DANTE, ii) the specific set-ups and ancillary detectors with concrete physics cases to be studied with the coming Radioactive Beam Facility SPIRAL 2, as a continuation of our research activities at Laboratori Nazionali di Legnaro. The physics cases presented will be based on the study of neutron-rich nuclei using multinucleon-transfer and deep-inelastic reactions, like for instance the ^{94}Kr on ^{198}Pt reaction (see Fig. 1).

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