

## **Reactions with exotic nuclei and active targets**

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Already for several years now nuclear reactions have been used to investigate the exotic properties of nuclei far from stability. The types of reactions are linked to the availability of radioactive ion beams (RIBs). While the beginnings of research in this field were characterized by the use of collisions at medium-high energy, upgrades at several production facilities are finally providing RIBs in the range of a few to about 20 MeV/nucleon, energies which are well-suited for direct reactions and transfer reactions in particular. These are a very powerful probe to obtain spectroscopically detailed information on nuclei in regions of the nuclear chart, key to our understanding of the nuclear structure. Interesting and promising results have already been obtained among others at REX-ISOLDE (CERN, Geneva) and GANIL (Caen), for example very recently in the region of neutron-rich Ni nuclei [1,2].

Adequate detection instruments are being developed to respond to the challenges posed by the use of weak beams in inverse kinematics. Gamma-ray detection serves the double purpose of resolving states in nuclei where their density is high, and providing information on intra-nucleus transitions that greatly helps spin assignments [1]. In other cases the use of active targets is the only way to achieve a sufficient luminosity, thanks to the possibility of having a large target thickness without compromising on energy resolution. Some examples will be presented both of performed measurements and of opportunities opening with the development of the new generation of these instruments.

[1] J. Diriken et al. submitted to Phys. Rev. Lett.;

[2] M. Moukaddam et al., in preparation.