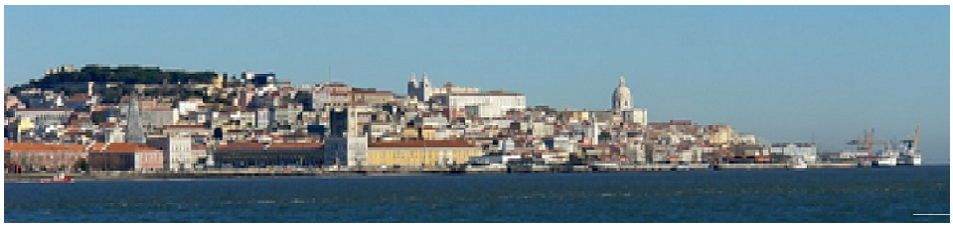

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Spectroscopy investigation of the 78Ni region: Potential avenues for a joint effort within EURISOL-DF

The ISOL mode of production of radioactive ion beams (RIB) is —for the time being—the only one which can provide the beam optical qualities that allow employing the whole set of the most refined techniques for optical, mass, γ, particles spectroscopy and spectrometry. At very low beam energies, three main measurement domains, exploiting (*i*) beam manipulation by electromagnetic traps, (*ii*) interaction with the hyperfine field and (*iii*) spectroscopy of β-delayed emission products are areas of excellence of ISOL facilities. Furthermore, with post-accelerated beams, precise direct nucleon exchange reactions and multiple coulomb excitation measurements are achievable in the most favorable conditions. Precision is the main asset of measurements within ISOL RIB-production conditions. Not only precision of the measurement itself, but precision in the comparison with theory they can provide: unambiguous determination of the total angular momentum of the nuclear states, information of the configurations involved, or precise knowledge of the mass relationships between neighbor nuclei for instance, provide key, unique insights into the nuclear structure.

The ^{78}Ni region is in the present focus of nuclear structure investigations worldwide. While it is clear that fragmentation facilities remain (and will remain for a while) unchallenged for first, discovery spectroscopy, cutting edge experiments continue to be performed at European presently operated ISOL facilities, like ISOLDE/CERN, IGISOL/JYFL and ALTO, in this mass region, with the highest level of scientific outputs. For instance, the first experimental evidence of shape coexistence in the ^{78}Ni could not have been understood without joining information from mass measurement at IGISOL, laser spectroscopy at ISOLDE, and EC spectroscopy at ALTO. Starting from this recent example I will elaborate further what could be a possible way towards a joint, ISOL-based investigation effort to understand the $N = 50$ shell gap evolution and the structure of the ^{78}Ni region, extended also to possibilities offered by high-quality post-accelerated beams at HIE-ISOLDE and SPES.

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