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Recent technical developments and mass measurements above the potentially doubly-magic nuclide ^{78}Ni at ISOLTRAP

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ISOLTRAP [1] mass measurements of neutron rich copper isotopes are presented. ^{79}Cu could be addressed by the first time using a Multi-Reflection Time-of-Flight Mass Spectrometer (MR-ToF MS) [2]. With only one proton above the $Z = 28$ core, the binding energies of the copper isotopes are sensitive to the evolution of nuclear shell structure close to the doubly-magic ^{78}Ni isotope. Preliminary results in combination with a shell-model theory will be shown.

To reach even more exotic nuclides and to improve ISOLTRAP's mass precision limit, a position-sensitive ion detector was installed upstream the precision Penning-trap. It will allow the application of the Phase-Imaging Ion-Cyclotron-Resonance (PI-ICR) detection method developed at SHIPTRAP/GSI [3]. This new method offers compared to the presently used Time-Of-Flight Ion-Cyclotron-Resonance detection technique [4] higher precision and resolution in shorter measurement time, and thus the ability to resolve low-lying isomers. The current status, first measurements, and an outlook on the implementation of the PI-ICR technique at ISOLTRAP will be presented.

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