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RFQ Developments at the CERN-ISOLDE Offline 2 mass separator

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The Offline 2 mass separator laboratory is part of the CERN-ISOLDE Offline facilities - a suite of installations required to perform essential quality control on target and ion source units before irradiation at CERN-ISOLDE. The facility is also used for extended preparatory offline studies as a prerequisite before conducting any beam development on-line, especially establishing systematic effects. The Offline 2 separator resembles the online CERN-ISOLDE Frontend and employs identical services such as beam instrumentation, gas delivery system, laser ionization and the equipment control system. The facility is able to generate dc as well as bunched non-radioactive beams up to an energy of 60 keV. The mass resolving power of the existing 90° dipole mass separator magnet is $R \approx 500$. The ion beams can be cooled and bunched in an unmodulated RFQ. In order to study effects of the RFQ buffer gas on the formation of molecular species, a dedicated identification setup is required. We intend to employ a Wienfilter after the RFQ. This work presents initial beam dynamics simulations through the RFQ and the mass filter. The simulations are based on 3D RF-fields. Furthermore, we present the ongoing installation of a Magnetof ion detector and an emittance meter in front of and behind the RFQ, respectively. Finally, the beam measurements as time resolved ion counts as well as the emittance will be compared with the simulations.

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