Particle identification with Bragg spectroscopy at ISOLDE Solenoidal Spectrometer

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The development of radioactive ion beam facilities has enabled the study of nuclear reactions involving short-lived nuclei. Experiments of this kind require intense, highly energetic, exotic beams with good emittance, such as those produced using the online separation method employed at ISOLDE, CERN. One potential drawback of this approach is the presence of beam impurities. To address this limitation and enable identification of recoiling species, a new, fast-counting, gas-filled detector was developed. It consists of an axially segmented ionisation chamber and a multi-wire proportional counter (MWPC). The former is used to perform Bragg spectroscopy, allowing for the identification of isotones with atomic numbers up to approximately 50. The MWPC, utilising the delay-line readout method, provides two-dimensional positional information with a resolution of 1 mm and can be used for pileup suppression and beam tuning. The design of the detector and commissioning results, obtained at the ISOLDE Solenoidal Specrometer during the 2025 experimental campaign, will be presented.