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Recent developments and results of WITCH

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The WITCH set-up (Weak Interaction Trap for Charged Particles) that was installed at ISOLDE/CERN combines a double Penning trap system to store radioactive ions and a retardation spectrometer to probe the energy of the daughter recoil ions [1]. The primary aim is to search for scalar and/or tensor interactions in nuclear beta decay by precisely determining the beta-neutrino angular correlation coefficient a. This can be extracted from the measured energy spectrum of the recoiling nuclei after beta decay in the WITCH set-up. In the last years the set-up was upgraded (better vacuum, buffer gas purification, electro-polished electrodes, compensation magnet) and further optimized to allow for measurements with the mirror nucleus 35Ar. A first such measurement was already performed last year and allowed the investigation of systematic and unwanted effects in the system, which were compared with simulations and countermeasures were implemented in the WITCH system. The aims of this years campaigns are a calibration of our set-up with an electron capture nucleus and a complete recoil spectrum of 35Ar.

[1] M. Beck et al., Nucl. Instrum. and Meth. A 503 (2003) 569.

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