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Isotopenphysik

I N V I T A T I O N

for a

V E R A - S E M I N A R

with

Susan Herb

CologneAMS, University of Cologne, Germany

Developments at the Cologne 10 MV tandem accelerator AMS beam line for ^{60}Fe AMS measurements

Only a few accelerator facilities around the world provided the needed high energies for isobar separation for medium mass radionuclides like ^{53}Mn and ^{60}Fe. Therefore, CologneAMS aimed to enlarge its measurement capabilities by use of the Cologne 10 MV FN tandem accelerator. It was exclusively used for nuclear structure experiments which did not demand equally high ion beam transport qualities. In 2018 the newly built AMS beam line was put in operation and in 2019 first test measurements of ^{60}Fe using the gas-filled magnet were conducted. The revealed high transmission losses and system instabilities were investigated and overcome by a range of setup developments. They have enabled the required long-term stability with high transmission. With that test measurements of standard ^{60}Fe/Fe ratios were performed with a blank level down to $5x10^{-15}$ which is assumed to be caused by memory effect. Additionally, first completely automatic AMS measurements were successfully performed. Furthermore, the ion beam development in terms of trajectory and shape inside and after the gas-filled magnet was investigated. The corresponding Monte-Carlo simulations were adjusted by including an approach for the formerly not-included gas-density effect.
The talk will report on the developments, the current status and the gas-filled magnet investigations.

Thursday, 12. May 2022, 16:30 o'clock

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