Contribution ID: **17** Type: **Oral**

Monte Carlo simulation of a detection system for optical photons at CRYRING

Tuesday, 10 May 2016 09:40 (20 minutes)

CRYRING offers the possibility to perform high precision laser spectroscopy experiments on a range of highly charged heavy ions. The wavelengths of fluorescence photons emitted in these experiments range from the UV (e.g. transitions in singly charged magnesium and beryllium ions at 280 nm and 313 nm, respectively) to the near infrared (e.g. in measurements of dielectric recombination in singly charged calcium ions at 854 nm and 866 nm).

For these laser spectroscopy experiments a general purpose optical photon detection system is needed, which should efficiently collect fluorescence photons emitted along the ion beam while suppressing background photons produced by excited rest gas molecules in the beam pipe volume. In order to achieve this, we use elliptical mirrors to reflect photons towards the viewport windows and a compound parabolic concentrator, to further guide photons under specific incident angles onto PMTs. Different options are used for the UV- and infrared photons and are analyzed with a Monte Carlo simulation. The resulting optimized detector design and expected efficiency will be presented.

The project is supported by BMBF under contract number 05P15PMFAA.

Primary author: THOMAS, Dominik (WWU Münster - Institut für Kernphysik)

Co-authors: Dr HANNEN, Volker (Institut für Kernphysik, Uni Münster); ANDELKOVIC, Zoran (GSI, Darmstadt)

Presenter: THOMAS, Dominik (WWU Münster - Institut für Kernphysik)

Session Classification: Talks