NEUTRALISATION OF ACCELERATED IONS AND DETECTION OF RESULTING NEUTRALS

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Abstract

At the University of Kiel, the Department of Experimental and Applied Physics is running an ECR ion source in order to, amongst others, calibrate space instruments designed to measure solar wind properties and suprathermal particles. The ion source is able to produce medium to highly charged ions which are then accelerated by an electrostatic field up to 400keV per charge. In order to extend the particle spectrum from ions to neutral atoms we are planning to install a device for the beam particle neutralisation. It will be used to calibrate instruments which measure neutral particles. This device will be located downstream from the sector magnet and the acceleration-stage. The sector magnet separates the ions by their m/q ratio. This way the type and the energy of the ions can be determined before the neutralisation. Neutralisation can be achieved either by passing the ions through a thin carbon foil (thickness ~88nm) or through a gastarget (thickness ~6mm, pressure ~0.1mbar) where charge-exchange occur. The remaining ions behind the neutraliser will be suppressed by an electrostatic separator. Both methods will alter the beam properties and lead to a divergence in energy and an angular spread of the beam. Simulations regarding these effects will be discussed. The overall progress on this project will be presented.

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