Installation of a gas terminal stripper and a gas/foil post stripper system at the 5.5 MV Demokritos Tandem Van de Graaff accelerator[†]

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A gas stripper system was installed inside the terminal of the accelerator in addition to the existing terminal foil stripper system, while two additional post strippers (one gas and one foil) were also installed in the beam line between the analyzing and switching magnets of the Tandem. These additions are needed for the production of He-like ions used in the APAPES[‡] project to investigate electron capture phenomena in ion-atom collisions by high resolution zero-degree Auger projectile electron spectroscopy in a dedicated experimental setup first put in operation two years ago.

Older experiments [1] have shown that for He-like ions foil stripping results in a mixed-state ($1s^2$, 1s2s) beam, while gas stripping in the terminal can produce an almost pure ground-state ($1s^2$) beam. Thus, ion-atom collision measurements using both strippers will allow for the determination of state-selective capture contributions solely from the metastable state (1s2s) of the ion observable in the associated projectile K-Auger electron spectrum. In addition, post-stripping will allow us to obtain ion charge states whose production is not possible with only one stage of stripping [2].

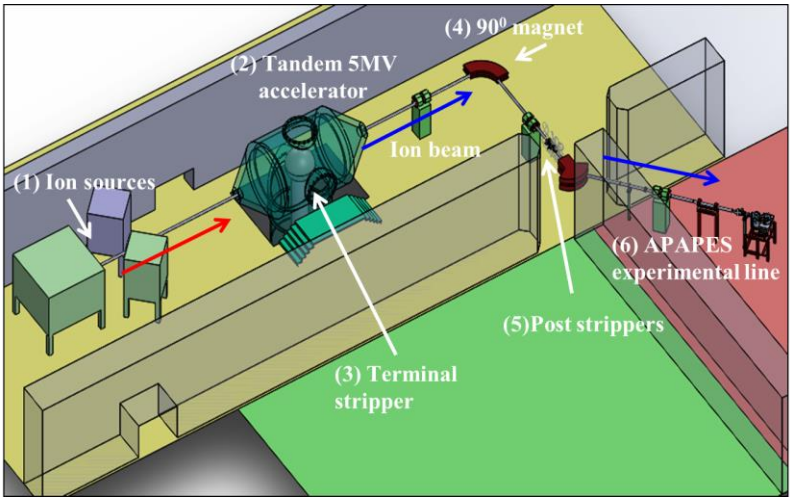

Figure 1: The TANDEM accelerator laboratory of the NCSR "Demokritos" and the APAPES experimental station. The position of the three new strippers is indicated.

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