

Atomic Physics with Accelerators: Projectile Electron Spectroscopy (APAPES) *

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The new research initiative APAPES (<http://apapes.physics.uoc.gr/>) funded by THALES* is presently setting up a new experimental station at the 5.5MV TANDEM of the National Research Center "Demokritos" in Athens with a dedicated beam line for atomic collisions physics research. A complete zero-degree Auger projectile spectroscopy apparatus is being put together to perform high resolution studies of electrons emitted in ion-atom collisions.

A single stage hemispherical spectrometer with a 2-dimensional position sensitive detector combined with a doubly-differentially pumped gas target will be used to perform a systematic isoelectronic investigation of K-Auger spectra emitted from collisions of pre-excited and ground state He-like ions with gas targets using novel techniques. The goal is to provide a deeper understanding of cascade feeding of the $1s2s2p\ ^4P$ metastable states in collisions of He-like ions with gas targets and further elucidate their role in the non-statistical production of excited three-electron $1s2s2p$ states by electron capture, recently a field of conflicting interpretations awaiting further resolution¹.

First beam tests of the apparatus will soon be completed and the spectrometer is expected to become fully operational by the end of this summer. Here, we report on the status of the APAPES project, the description of the beam line, the spectrometer and data acquisition system as well as our plans for the future.

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¹T. J. M. Zouros, B. Sulik, L. Gulyás and K. Tökési, Selective enhancement of $1s2s2p\ 4P_J$ metastable states populated by cascades in single-electron transfer collisions of $F^{7+}(1s^2/1s2s\ ^3S)$ ions with He and H_2 targets, Phys. Rev. A **77** (2008) 050701R.