

## MEASUREMENTS OF VACUUM ASSISTED PHOTOIONIZATION AT RELATIVISTIC ENERGIES

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We present the first measurement of photon impact ionization of K and L-shell of Au and K-shell of Ag targets in the 1-GeV energy range [1]. We show that the cross section is dominated by a contribution from a new channel called vacuum-assisted photoionization. In this process the energy-momentum balance associated with the removal of the inner-shell electron is obtained by conversion of a high-energy photon into an electron-positron pair.

The experiment has been performed at the ESRF (Grenoble, France) using tagged-Compton backscattered photons (GRAAL beamline).

The vacuum-assisted photoionization process has been observed by means of a coincidence between pair creation and K- or L- X-ray fluorescence, studied as a function of target thickness.

This measurement is consistent with the theoretical prediction that vacuum-assisted photoionization is the most probable ionization mechanism at very high energies [2].

[http://documentation.in2p3.fr/publi\\_in2p3/data/Publi\\_Document\\_34177.pdf](http://documentation.in2p3.fr/publi_in2p3/data/Publi_Document_34177.pdf).

[2] D. C. Ionescu, A. H. Sorensen and A. Belkacem, Phys. Rev. A59(1999)3527.

### References

[1] D. Dauvergne, A. Belkacem, F. Barrué, J.-P. Bocquet, M. Chevallier, B. Feinberg, R. Kirsch, J.-C. Poizat, C. Ray and D. Rebreyend, to be published in Phys. Rev. Lett.. Preprint: