Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Oscillations in the wavelength distributions following photon interferences FRANCOIS FREMONT, BURCU FRANKLAND, HERVE GILLES, SYLVAIN GIRARD, JEAN-YVES CHESNEL, Cimap, 6 bd du Mal Juin 14050 Caen Cedex France, RAUL O. BARRACHINA, Centro Atomico, 8400 S. C. de Bariloche, Rio Negro, Argentina, CIMAP TEAM, BARILOCHE TEAM — Very recently, interferences using a single electron source were studied experimentally [1] and theoretically [2]. Briefly, a He^{2+} ion captures both electrons from H_2 in a doubly excited state 2l2l'. After the collision, one He^{**} electron is emitted by Auger effect. In the backward direction, it scatters both protons, producing oscillations in the angular distribution of the intensity, due to Young-type interferences. Moreover, we found that the width of the energy distribution also oscillates, with the same period but in counter phase with the intensity oscillations. Since this experimental resembles the original double-slit experiment by Young (1807), we investigated photon interferences in order to determine the wavelength distribution as a function of the position on the detection screen. A detailed analysis reveals maxima and minima in the width distribution, corresponding to minima and maxima in intensity, respectively, inducing a complete analogy between electron and photon interferences [1] J.-Y. Chesnel *et al.*, Phys. Rev. Lett. **98** 100403 (2007). [2] R. O. Barrachina and M. Zitnik, J. Phys. B **37** 3847 (2004).

Francois Fremont
Cimap, 6 bd du Mal Juin 14050 Caen Cedex France

Date submitted: 04 Jun 2010 Electronic form version 1.4