Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Persistence of the Polarization in a Fusion Process JEAN-PIERRE DIDELEZ, IPN UParis-Sud, CLAUDE DEUTSCH, LPGP UParis XI, PERPOL COLLABORATION — We propose an experiment to test the persistence of the polarization in a fusion process,using a TW laser hitting a prepolarized HD target [1].The polarized protons and deuterons heated in the plasma induced by the laser have a significany probability to fuse producing a 3He nucleus and a Gamma ray or a neutron in the final state. The angular distribution of the radiated Gamma rays and changes in corresponding total cross-section are related to the polarization persistence, but the resulting signal appears rather weak. Neutrons are hadronically produced with a larger cross-section and, are much more easily detected. A significant reduction of the cross-section by parallel deuterons polarization as well as a structured angular distribution of emitted neutrons is fairly predicted by theory arguments. It is thus expected that the pertaining signal on the neutron counting rate could be experimentally observed. Magnetic field,relaxation times and possibilities of local investigations will also be discussed.

[1] J.P. Didelez and C. Deutsch, J. Physics: Conference Series 295, 012169 (2011) and laser Part. Beams 29, 169 (2011)

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Date submitted: 12 Jul 2011 Electronic form version 1.4