

# Solid Hydrogen Film Production for Laser Target

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## **Abstract:**

With the development of very high power lasers, one can envisage the production of energetic beam of protons. These protons can be used for example in medical domains such as proton therapy. The proton beam can be obtained by focusing the laser beam on a thin Hydrogen foil. The most mechanism experimentally investigated is the Target Normal Sheath Acceleration (TNSA) where ions are accelerated at the rear side of thin target in a quasi-electrostatic sheath formed by fast electrons propagating from the target front side. In this context, the low temperature laboratory of the CEA-Grenoble (France) has developed a cryostat able to produce a continuous film of solid Hydrogen of some tens of microns in thickness and one millimeter in width. The same cryostat can also be used other cryogenic fluids such as Deuterium. The solid Hydrogen film is obtained by using a new extrusion technique, without any mobile part, only by using the thermodynamic properties of the fluid. Some studies of interaction between the solid Hydrogen film and the laser beam PALS (Czech Republic) will be performed at the end of 2014.

A description of the cryostat and experimental results will be presented.

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