Status of the 45 TW laser at the University of Santiago de Compostela

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The Laser Laboratory for Acceleration and other applications is a facility of the Universidade de Santiago de Compostela in Spain. It was designed originally designed to produce radioisotopes by laser acceleration for image medical applications.

The facility has the STELA laser, acronymous of Santiago TErawat Laser. This laser corresponds with the Alpha10/XS model, based on the Ti:Sapphire technology for amplifying a femtosecond seed.

The facility makes use of this laser in two different repetition rate and energy regime. By one side, 1kHz, 1mJ beam is used for X-Ray production as well as for being coupled with a high-precision micromachining system where it can be changed the surface properties of different materials or microfluidic devices can be fabricated. This mJ beam has a pulse duration of 35fs, and a contrast 10^6@ASE with a value for M^2 of 1.2. By other hand, the high-power beam is used for producing protons that can be used for producing radioisotopes for medical imaging applications (^{11}C, ^{13}N, ^{15}O, ^{18}F). This beam has very good properties for this end: 10Hz, 1.2J, 25fs, contrast of 10^{10} at 200ps and SR 0.74 (without deformable mirror). In the inner of its architecture, it has a system to avoid back reflection when working with solid targets, avoiding undesired internal optical damages.

The facility is going to open a new vacuum experimental line for increasing the number and kind of experiments could be perform at the L2A2 facility. A call will be opened by 2022.