The Spanish Petawatt Laser

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The Spanish Center for Pulsed Lasers (Centro de Láseres Pulsados, CLPU) is a national Spanish facility specialized in high repetition ultraintense lasers. Its one of the Unique Scientific and Technological Facilities (Instalación Científico Técnica Singular, ICTS) of the Map of the Ministry of Science and Innovation. It is a public consortium participated by the Central Government of Spain, the Regional Government (Junta de Castilla y León) and the University of Salamanca.

CLPU is a unique infrastructure thanks to VEGA a high repetition rate Petawatt laser. VEGA is a CPA Ti:Sapphire laser delivering pulses of 30 fs. It has a single front end with an XPW system to enhance pulse contrast and three synchronized lines, VEGA-1, 20 TW at 10 Hz, VEGA-2, 200 TW at 10 Hz and VEGA-3, 1 PW at 1 Hz. VEGA-3 is the highest peak power in Spain and VEGA-2, the second. Both are considered relevant in the global scenario (see www.ucil.org) and are offered to the domestic and international scientific community based on a competitive access system. Moreover CLPU is a member of LaserLab Europe V and offers through that network TransNational Access. CLPU is a member of RADNEXT and also offers access trough that project.

There are just a few Petawatt lasers at one Hz operative in the world and VEGA-3 is one of them. We are intensively working on developing targetry, detection, databases and more things compatible to the high repetition rate of VEGA, to specialize the Salamanca CLPU in high repetition rate experiments to pave the road for Artificial Intelligence to enter in this arena.

Being the Extreme Light Infrastructure, ELI, the most relevant initiative of extreme lasers in Europe, if not in the world, CLPU has been closely following this development and now participates in the ELI-IMPULSE project offering also access through it.

CLPU is the pioneering center in Spain for laser acceleration. Regarding electron energy, CLPU is the second system in our country after the ALBA synchroton. CLPU offers also other secondary sources, as protons and X rays (betatron sources). Also neutron sources are under development. All sources are obviously pulsed.

Moreover CLPU offers other lasers for access, particularly a multi GW Khz repetition rate femtosecond system, 6 fs CEP systems and many more that complement our fs technology expertise. All this can be found at our web page, www.clpu.es.