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Short Pulse Diagnostics Improvements in the Vulcan Laser System

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The Vulcan laser is a Nd:glass amplification chain that is capable of delivering up to 2.6 kJ in 8 beam lines in two target areas.

Combined with 6 long pulse beams, with user selectable pulse length from 0.1ns to 8ns, short pulses are available with pulses down to 500fs using the Chirped Pulse Amplification (CPA) on two beam lines.

Recently a new diagnostics system became operational, making the diagnostic data from the laser available to the User. To characterize the short pulse a new large window single shot autocorrelator was developed and is now operational. Also the contrast on the Petawatt beamline was investigated. Pre-pulses were identified and a new scheme of post-to- prepulse conversion was discovered.

Finally, the new software for the analysis of the GRENOUILLE data developed in collaboration with University of Pisa is planned to be integrated with the diagnostic system. Also the characterization of the contrast in one of the two target area is under discussion, where new electrical noise mitigation will be setup in collaboration with the ENEA at Frascati.

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