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Ultrafast diagnostic for ultrashort laser pulse, applied to the VULCAN and FLAME laser systems

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The complete characterization of the laser pulse parameters was made using a new algorithmic method: GRenouille/FrOG (GROG), based on the 1D Conjugate Gradient Minimization Method. The purpose is, analyzing experimental FROG/GRENOUILLE traces, to accurately retrieve intensity and phase both in the temporal and spectral domain so as to completely characterize an Ultra Short High Power laser pulse. This algorithm shows important features in the reconstruction of many different pulse classes. The employment of this algorithm also permits the inclusion of material response function present in the FROG/GRENOUILLE set-up. The GRENOUILLE traces of FLAME Probe line pulses (60 mJ, 70 fs, 10 Hz) were acquired in the FLAME Front End Area (FFEA) at the Laboratori Nazionali di Frascati (LNF), Istituto Nazionale di Fisica Nucleare (INFN). A FROG diagnostic is being developed in Central Laser Facility in RAL able to characterize the 100J, 1.4ps, 2nm @1053.5 nm laser pulses in Target Area West (TAW).

Summary

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