

Seminar

Spectral Broadening in a Multi-pass Cell for Laser Pulse Compression

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A typical way to compress a laser pulse in time domain is to stretch it in frequency domain i.e. spectral broadening. This is achieved by non-linear self-phase modulation (SPM) which adds new frequencies to the pulse. The compression can then be achieved after compensating for any dispersion added to the pulse during SPM.

We explored one such pulse compressor setup for Yb:KGW laser of 1030nm wavelength operated at 1kHz repetition rate and 180 femtoseconds pulse duration. We use a gas filled chamber inside which the laser beam is made to have 8 passes (hence multi-pass cell) focusing along the way using two concave mirrors. We investigated the spectral broadening and the characteristics of the output beam, mainly its compressibility by varying parameters like type of gas, chamber pressure, beam spot size, focusing geometry and pulse energy.

Wednesday, Jul 22nd 2026

14:30 Hrs (Tea / Coffee 14:15 Hrs)

Seminar Hall, TIFRH