

Picosecond-contrast degradation in CPA laser systems

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The importance of a high laser contrast in laser-plasma experiments is widely known. While the temporal contrast in the nanosecond time scale is well understood and optimized, short pulse laser systems around the world still suffer from a slow rising slope of the peak and hence a worse contrast in the regime of picoseconds prior the peak intensity.

We identified noise in a CPA stretcher to be the origin of this short timescale contrast degradation. We present simulations on the influence of different kinds of noise – e.g. dust or surface deformation – onto the spectral phase and therefore the temporal pulse shape.

The simulation results are compared to measured pulse profile and recommendations for future stretcher designs are concluded.

Primary author: Mr SCHANZ, Victor (GSI, Darmstadt)

Co-authors: Prof. ROTH, Markus (TU Darmstadt); Dr BAGNOUD, Vincent (GSI, Darmstadt)

Presenter: Mr SCHANZ, Victor (GSI, Darmstadt)

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