

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.

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