

Abstract Submitted
for the TS4CF08 Meeting of
The American Physical Society

Control of Spectral Phase of Ultrafast Optical Pulses with Grisms

CHARLES DURFEE, JEFF FIELD, JEFF SQUIER, Colorado School of Mines, STEVE KANE, Horiba Jobin-Yvon — High-quality dispersion management is critical for ultrafast optics. Grisms are a combination of diffraction gratings and prisms. We can use grisms for high-fidelity control of the spectral phase of ultrafast pulses, making systems much more compact and easy to adjust. While the spectral phase of a given system can be obtained with ray-tracing, analytic expressions are desirable for exploring and optimizing new designs. We show that we can analytically calculate the spectral phase of a range of grism-like structures by making a superposition of basic tilted window modules. For example, a prism pair can be described by starting with a tilted slab of glass, which defines the outer edges of the prism pair. The inner edges of the prism pair are then created by superposing a tilted slab of air, which removes glass between the prisms. We will discuss the applications of these grism designs to ultrafast amplifiers and pulse shapers.

Charles Durfee
Colorado School of Mines

Date submitted: 23 Sep 2008

Electronic form version 1.4