

Dispersion-Less All Reflective Split and Delay Unit for Ultrafast Metrology

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Abstract : An all-reflective split and delay unit is designed for dispersion free measurement of broadband ultrashort pulses using a pair of reflective knife edge prism for splitting and recombining of the measuring pulse. It is based on symmetrical wavefront splitting of the measuring pulse having two separate arms to independently shape both split parts. We have validated our delay line with NIR -femtosecond pulse measurement centered at 800 nm using second harmonic-Interferometric frequency resolved optical gating (SH-IFROG). The delay line is compact, easy to align and provides attosecond stability and precision and thus make it more versatile for wide range of applications in ultrafast measurements. We envision that the present delay line will find applications in IR-IR controlling for high harmonic generation (HHG) and attosecond IR-XUV pump-probe measurements with solids and gases providing attosecond resolution and wide delay range.

Keywords : HHG, nonlinear optics, pump-probe spectroscopy, ultrafast metrology

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