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Title:Avoiding temporal distortions in tilted pulses

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Abstract:Tilted femtosecond laser pulses, having an intensity front with an angle to the propagation direction, can be generated by a dispersive element and a lens or mirror for imaging. Here we show that conventional geometries, for example with a grating at Littrow's condition, produce significant temporal distortions over the beam profile. The aberrations are the result of a mismatch between the grating's surface and the object plane of the imaging system. This changes the chirp of the pulses over the beam profile and lengthens the pulses to picoseconds for millimeter-sized beams. The distortions can be avoided by choosing a geometry in which the propagation direction of the tilted pulses is perpendicular to the grating's surface. (C) 2012 Optical Society of America.

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