Docket #: S05-062

Simple technique to retrieve phase and magnitude of weak ultrashort laser pulses using a stronger unknown pulse

To determine the phase and magnitude of the complex electric field of weak ultra-short pulses we propose to use a dummy strong pulse time delayed relative to the weak pulse that needs to be characterized. This whole sequence of two pulses is then sent to an optical spectrum analyzer, which yields the square of the FT magnitude of the complex electric field function of the pulse sequence. By simply choosing a strong pulse time delayed with respect to the weak pulse, the whole pulse sequence becomes close to a minimum phase function. This makes the recovery of the full complex electric field of the weak pulse possible from only the measurement of the FT magnitude of the complex electric field function of the pulse sequence. The recovery processing conveniently involves a simple and fast iterative error reduction algorithm, such as the Fienup algorithm.

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Advantages

- Medical Imaging
- Surgery
- Micro-machining
- Optical telecommunication
- 3D Optical Waveguide Fabrication

Patents

- Published Application: [20070055466](#)
- Published Application: [WO2006107765](#)
- Published Application: [20070027689](#)
- Published Application: [WO2006102056](#)
- Issued: [7,313,493 (USA)](#)
- Issued: [7,369,953 (USA)](#)

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