

DIN 58175-1:2013-07 (D/E)

Laser und Laseranlagen - Bestimmung der Eigenschaften von ultrakurzen Laserpulsen - Teil 1: Grundlagen; Text Deutsch und Englisch

Lasers and laser-related equipment - Determination of the properties of ultra-short laser pulses - Part 1: Principles; Text in German and English

| Inhalt | Seite |
|-------------------------------------------------------------------------|-------|
| Vorwort | 4 |
| Einleitung | 6 |
| 1 Anwendungsbereich | 8 |
| 2 Normative Verweisungen | 8 |
| 3 Formelzeichen und Einheiten | 8 |
| 4 Grundlagen | 14 |
| 4.1 Allgemeines | 14 |
| 4.2 Kreisfrequenz..... | 14 |
| 4.3 elektrische Feldamplitude | 14 |
| 4.4 Leistungsdichteverteilung im Puls..... | 14 |
| 4.5 optische Leistung..... | 14 |
| 4.6 Pulsfolgezeit | 16 |
| 4.7 Pulsenergie | 16 |
| 4.8 Halbwertsdauer bezogen auf die optische Leistung (Pulsdauer) | 16 |
| 4.9 effektive Pulsdauer..... | 16 |
| 4.10 Pulsvolumen | 18 |
| 4.11 Pulskontrast..... | 18 |
| 4.12 räumlicher Chirp..... | 18 |
| 4.13 Tastverhältnis | 18 |
| 4.14 zeitliche Phasenfunktion | 20 |
| 4.15 zeitlicher Chirp..... | 20 |
| 4.16 linearer zeitlicher Chirp..... | 20 |
| 4.17 spektrale Leistungsdichte | 20 |
| 4.18 spektrale Halbwertsbreite..... | 22 |
| 4.19 effektive Spektralbreite | 22 |
| 4.20 Zeit-Bandbreiten-Produkt (TBP) | 22 |
| 4.21 spektrale Phase | 22 |
| 4.22 spektrale Gruppenlaufzeitdispersion (GDD) eines Pulses..... | 24 |
| 4.23 Gruppengeschwindigkeitsdispersion (GVD) optischer Materialien..... | 24 |
| 4.24 Autokorrelationssignal | 24 |
| 4.25 FROG-Spektrogramm (en: Frequency-resolved optical gating)..... | 26 |

Content

page

| | |
|-------------------------------------------------------------------------------------|----|
| Foreword..... | 5 |
| Introduction | 7 |
| 1 Scope | 9 |
| 2 Normative references | 9 |
| 3 Symbols and units of measurement | 9 |
| 4 Principles | 15 |
| 4.1 General..... | 15 |
| 4.2 Angular frequency | 15 |
| 4.3 Electric field amplitude | 15 |
| 4.4 Power density within the pulse | 15 |
| 4.5 Optical power | 15 |
| 4.6 Pulse repetition time | 17 |
| 4.7 Pulse energy..... | 17 |
| 4.8 Full width at half maximum defined via the optical power (pulse duration) | 17 |
| 4.9 Effective pulse duration | 17 |
| 4.10 Pulse volume | 19 |
| 4.11 Pulse contrast | 19 |
| 4.12 Spatial chirp | 19 |
| 4.13 Duty cycle | 19 |
| 4.14 Temporal phase | 21 |
| 4.15 Temporal chirp | 21 |
| 4.16 Linear temporal chirp | 21 |
| 4.17 Spectral power density | 21 |
| 4.18 Spectral full width at half maximum | 23 |
| 4.19 Effective spectral width..... | 23 |
| 4.20 Time-bandwidth-product (TBP) | 23 |
| 4.21 Spectral phase | 23 |
| 4.22 Spectral group delay dispersion (GDD) of a pulse..... | 25 |
| 4.23 Group velocity dispersion (GVD) of optical materials | 25 |
| 4.24 Autocorrelation signal..... | 25 |
| 4.25 FROG spectrogram (frequency-resolved optical gating) | 27 |