

username

••••••••

LOGIN

[New Account »](#)
[Forgot Password? »](#)

Type your search term here

GO

[Advanced Search »](#)



▪

The Impact of Aerosols and Battlefield Obscurants on Ultrashort Laser Pulse Propagation

Authors: [Chase A Munson](#); [Anthony R Valenzuela](#); [ARMY RESEARCH LAB ABERDEEN PROVING GROUND MD WEAPONS AND MATERIALS RESEARCH DIRECTORATE](#)

Abstract: Ultrashort pulsed laser propagation through the atmosphere has been studied by both theory and simulation and through laboratory experiments. At sufficiently high pulse energies (on the order of several gigawatts), propagating laser pulses become subject to various nonlinear optical effects, and optical phenomena known as laser filaments are produced. Applying ultrashort laser pulses and laser filaments in the battlefield environment requires a solid physical and theoretical understanding of how these pulses and filaments propagate through the air and interact with battlefield obscurants, such as diesel exhaust, smokes, and dust. Existing open literature on the topic has investigated only the impact of well-defined, aqueous aerosols on ultrashort laser pulses and filaments. In this report, we review the existing works on the topic, discuss where more fundamental scientific understanding is needed, and outline some of the challenges that need to be addressed to utilize the potential of ultrashort laser pulses on the battlefield.

[Email This Abstract](#)

Limitations:	APPROVED FOR PUBLIC RELEASE
Description:	Final rept. 1 Oct 2010-30 Sep 2011
Pages:	34
Report Date:	Dec 2011
Report Number:	A497655



Keywords relating to this report:

- [AEROSOLS](#)
- [BATTLEFIELDS](#)
- [FILAMENTS](#)
- [LASER BEAMS](#)
- [OBSCURATION](#)
- [OPTICAL PHENOMENA](#)
- [PULSED LASERS](#)