

# Supercontinuum Generation by Amplification of Noise-like Pulses in Nonlinear Yb-doped Fiber Amplifier

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## Abstract

In this paper, we report on a supercontinuum generation by amplifying noise-like pulses (NLP) in a nonlinear Yb-doped fiber amplifier. The NLP source is a homemade Yb-doped all-fiber ring resonator mode-locked by nonlinear polarization rotation method. Noise like pulses possess repetition rate of 11.57 MHz, energy of 16.5 nJ and 3dB spectral bandwidth of 40 nm. Intensity autocorrelation function of NLP has a broad pedestal and a narrow central spike. The pedestal and the spike have temporal widths (Gaussian fit) of 77 ps and 100 fs, respectively. The NLPs are amplified by a Yb-doped fiber nonlinear power amplifier to achieve output power of 7.2 W. Nonlinear effects in amplifier drastically broadened the spectrum of NLPs and generated high power supercontinuum light with 10 dB spectral width of 1130 nm (from 1037 nm to 2167 nm). The presented supercontinuum generation system is an all-fiber compact structure and has an advantage that does not require nonlinear fiber.

**Keywords:** supercontinuum generation, noise-like pulse.

## Biography

Ebrahim Aghayari was born in 1981 in Zanjan, Iran. He received his BSc in condensed matter physics from Azarbaijan Shahid Madani University, Tabriz, Iran in 2005. He received MSc degree in photonics from Tabriz University, Tabriz, Iran. He is currently with Iranian National Center for Laser Science and Technology and also works toward his PhD thesis on ultra-short mode locked fiber lasers in Azarbaijan Shahid Madani University. He is interested in nonlinear phenomena in fiber amplifiers, mode locked fiber lasers and coherent beam combining.