

TO CJN, SYS, IAG, RIC

Transmission of 10 ps Pulses over 101.5 km of Standard Fibre using Midpoint Spectral Inversion.

A. Royset, S. Y. Set, I. A. Goncharenko, R. I. Laming,
Optoelectronics Research Centre, University of Southampton, UK.

Abstract

Linear transmission of 10 ps pulses over 101.5 km of standard fibre has been achieved by inverting the spectrum of the pulses at the midpoint of the link. The pulse source is a sliding frequency laser which generates transform limited pulses with 10 ps full width half maximum duration at a wavelength of 1532 nm. After 50 km of standard singlemode fibre with 16 ps/nmkm dispersion the pulses have broadened to 200 ps due to dispersion. The pulses are combined with a pump signal at 1535 nm, amplified and transmitted through 13 km of dispersion shifted fibre with dispersion zero at 1535 nm. The phase conjugate signal at 1538 nm, generated by four wave mixing, is filtered, amplified and transmitted through a second span of 51.5 km fibre which compresses the pulses back to its original pulse width. Limitations from self phase modulation in the transmission fibre has been observed. Ideally, spectral inversion should also compensate for self phase modulation if the power levels in the two spans are symmetrical. These effects has been studied with numerical simulation showing that the effect of self phase modulation is difficult to eliminate due to the asymmetrical fibre loss. Experimental results substantiate these findings and will be presented at the conference.

SUBMITTED TO

"NORWEGIAN CONFERENCE ON
OPTICS AND OPTOELECTRONICS"

TO BE HELD AT

USTAOSET, APRIL 23-26, 1995