SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2) Poster Session (P)

Author: Mr. Liang Zhang Beijing Research Institute of Telemetry(BRIT), China, 704zhangliang@sina.com

Mr. Xiangnan Liu Beijing Research Institution of Telemetry, China, liuxiangnan110@126.com Mrs. Yi Lin Beijing Research Institution of Telemetry, China, ylin1984@126.com

EXPERIMENT STUDIES OF COHERENT OPTICAL COMMUNICATION TECHNOLOGIES FOR INTER-SATELLITE LINKS

Abstract

Coherent optical communication is attractive more attention for inter-satellite optical links for its better sensitivity, its less vulnerability to background light. This paper presents experiment studies of coherent optical communication technologies for inter-satellite links based on wavelength adjustable narrow line-width (<5 kHz) semiconductors. In our experiment, the BPSK signal light is generated from a transmitter consist of a semiconductor laseran electro-optic phase modulator and an Erbium doped fiber amplifier (EDFA). After attenuating power, the signal light is introduced into a receiver. The receiver is composed of a narrow line-width semiconductor local laser, a polarization controller, a Costas Optical Phase Locked Loop (OPLL) and demodulator. An optical attenuator is inserted between the transmitter and the receiver instead of space loss in actual inter-satellite links. The OPLL is used to tuning the wavelength of the semiconductor local laser to track the variation of signal light wavelength, coming from temperature tuning to simulate Doppler Effect in GEO-LEO optical communication links. It is demonstrated that the Coherent communication experiment system successfully performed at date rate of 1Gbps. Sensitivity under -40dBm at Bit Error Rate (BER) of 10-6 is achieved.