

# **Performance improvement of spectral amplitude coding-optical code division multiple access systems using NAND detection with enhanced double weight code**

## **Abstract**

The bit-error rate (BER) performance of the spectral amplitude coding-optical code division multiple access (SACOCDMA) system has been investigated by using NAND subtraction detection technique with enhanced double weight (EDW) code. The EDW code is the enhanced version of double weight (DW) code family where the code weight is any odd number and greater than one with ideal cross-correlation. In order to evaluate the performance of the system, we used mathematical analysis extensively along with the simulation experiment. The evaluation results obtained using the NAND subtraction detection technique was compared with those obtained using the complementary detection technique for the same number of active users. The comparison results revealed that the BER performance of the system using NAND subtraction detection technique has greatly been improved as compared to the complementary technique.