

## **Channel spacing effect on SAC-OCDMA system based modified-AND subtraction detection scheme**

### **Abstract**

This paper focuses on the performance of different channel spacing with AND as well as modified-AND subtraction detection techniques emphasizing the spectral-amplitude coding optical code-division multiple-access (SAC-OCDMA) systems. Modified double-weight (MDW) codes are used as the signature codes for SAC-OCDMA systems. This study has been carried out through simulation of a real-like SAC-OCDMA system by using OptiSystem software from *optiwave<sup>TM</sup>*. It has been found that the modified-AND subtraction detection technique able to provide a good transmission of 0.8nm that close to 1nm channel spacings performance thus show that it is a good solution which able to provide bandwidth efficiency factor to the incoherent SAC-OCDMA system that can cut down 25% of the bandwidth usage.

**Keywords;** Channel Spacing, MAI, Phase Induce Intensity Noise (PIIN), SAC-OCDMA, Subtraction Detection Scheme