

## **Enhanced gain saturation model of non-linear semiconductor optical amplifiers**

### **ABSTRACT**

This study proposes an enhanced gain saturation model of non-linear semiconductor optical amplifiers (SOAs) by incorporating material-dependent gain compression factor. The rate equations are utilised with the extra gain compression term for Indium-Gallium-Arsenide material-based SOA to account for the steep relaxation oscillations behaviour of non-linear SOAs. The proposed gain saturation model is verified with experimental results that showed very good agreements with a mean square error of 0.094.

**Keyword:** Gallium arsenide; III-V semiconductors; Indium compounds; Optical saturation; Semiconductor optical amplifiers