

Optical power limitations in spectral-amplitude- coding optical code-division multiple-access systems due to stimulated Raman scattering

ABSTRACT

In is paper, the maximum power per chip to keep the Stimulated Raman Scattering (SRS)-induced tilt below a specific level in Spectral-Amplitude- Coding Optical Code-Division Multiple-Access (SAC-OCDMA) is evaluated for different number of users. A number of computer simulations have been conducted for this purpose. It is shown that as number of users grows, the power per chip must be decreased to control the SRS-induced tilt and to keep it below acceptable levels. It is also shown that SRS-induced tilt can significantly limit the power per chip levels when the number of users is large. This is the first time such a study is reported for OCDMA systems.

Keyword: Nonlinear effects; Nonlinearities; Optical code division multiple access (OCDMA); Optical transmission limitations; Spectral-amplitude-coding OCDMA (SAC-OCDMA); SRS tilt; Stimulated Raman scattering (SRS)