

# **Abstract**

**Moustafa Hussein Aly**

## **New trend for optical signal-to-noise ratio of disturbed Raman fiber amplifier**

In a distributed Raman fiber amplifier (DRFA), Raman amplification allows a lower signal launch powers to transverse the span above the noise floor while still increasing the optical signal-to-noise ratio (OSNR). It improves the noise figure and reduces the nonlinear penalty of fiber systems. In this paper, we demonstrate a new trend of OSNR at different pump configurations: forward, backward and bidirectional pumping for DRFAs as a function of fiber length. We also present the variation of OSNR with both input pump power and input signal power. It is found that forward pumping provides the highest OSNR, reaching its maximum value of 37 dB. However, backward pumping provides the smallest OSNR that has its maximum of 22 dB and the bidirectional pumping provides the moderate OSNR between the others having its peak of 26 dB.