Abstract

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Thulium Doped Fiber Amplifier in the S/S+ Band Employing Different Concentration Profiles

This work contains a comparative study for the signal gain of thulium-doped fiber amplifier (TDFA) in the S-Band. Different doping techniques are used to obtain different concentration profiles in silica fibers. The optimal one is found to be the step like profile. TDFA is investigated in new prepared glass hosts. These hosts include: silicate, bismuth, fluoride, tellurite, chalcohalide, and heavy metal oxide. The effect of the different parameters on signal gain of the optical amplifiers is studied, followed by a comparison to Select the best glass host. Results showed that the highest gain can provide by bismuth (Bi) glass host and broad band gain from 1450 nm to 1520 nm with a peak wavelength around 1480 nm. A maximum gain above 28.5 dB is obtained with 11 m long Bi-TDFA. These characteristics indicate that Bi-TDFA is a very promising candidate for S-band amplifiers.