

FIBRE-TO-THE-HUT; BROADBAND CONNECTION TO THE REMOTE USER IN AN AFRICAN SETTING

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We propose an optical network suited for fibre-to-the-hut application. This study experimentally investigates the performance of Raman-aided, vertical cavity surface emitting laser (VCSEL)-based networks optimized for the sparsely populated areas in Africa. Raman amplification is preferred due to its high gain, low noise figure over a wide wavelength range suited for long reach optical network systems. VCSELs on the other hand are attractive due to their low cost and low power consumption hence affordability by the low-income earning users in the remote villages of Africa. In this study, a 1550 nm VCSEL is modulated with a 4.25 Gbps pseudo-random bit sequence (PRBS) and transmitted over an ITU-T G 655 fibre. The performance of Raman amplification at different pumping configurations is demonstrated. The transmission quality is then analysed through BER measurements. Our findings showed that error-free transmissions extending to over 100 km are achieved. This is a relatively cheap all-optical network ideal for long reach supporting a broadband connection to a number of users.

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