ENHANCING SIGNAL QUALITY IN RADIO OVER FIBER LINKS HAVING THE LENGTH OF (100-200) KM

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Abstract:

In this paper, we build 3 calculating models of radio over fiber links having length of (100km - 200km) corresponding to the three positions of optical amplifier (EDFA) located on the link: at the end of link (PA), at the beginning of link (BA) and in the middle of link (LA). We then examine dominant noises that influence on signal quality, determine signal power, calculate signal-to-noise ratio (*SNR*) and Bit Error Rate (*BER*) at the receiver in each calculating model. Next, we compare and evaluate *BER* based on investigating the main parameters such as EDFA's gain, optical signal power launched to the fiber and transmission length. After that, an algorithm chart is built to calculate and determine the value of EDFA's gain, EDFA's position on the link so that the *BER* at the receiver will s till lie in the given range of values ($10^{-14} \leq BER \leq 10^{-12}$) corresponding to different transmission lengths. These results can be used as the reference documents in designing, operating and exploiting RoF links.

Key words: Radio over Fiber; SNR; BER; Boost Amplifier; Line Amplifier; Pre Amplifier; ASE noise.