

OPTICAL AMPLIFICATION FOR QUANTUM SOURCES OF ULTRASTABLE OPTICAL FREQUENCY

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The reach of any all-optical transmission is limitedly mainly by attenuation of transmission path and it can be extended by all-optical amplification. Bidirectional single fiber transmission introduces an issue of bidirectional symmetrical amplifiers in order not to lose advantage of path symmetry. In case of time transfer, quasi-bidirectional amplification might be acceptable when supported by specific arrangements, e.g. as much as possible equal arrangement for disjoint parts of the path. Time transfer with best available accuracy or optical frequency transfers require single path optical amplifiers that are further considered. In this constitution, unfortunately, reflections together with Rayleigh back-scattering will create feedback. In case feedback is strong enough and discrete amplifier operates in high gain regime (in order of 20dB) the whole system will start to lase. Lasing saturates the gain of amplifiers and also can generate errors, when lasing in a transmission band.

In poster under preparation we will review possible all optical amplification methods including those allowing to use non traditional transmission bands outside C band.