修士論文要旨

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論文題目　　　SSFBGを用いたOCDMAにおけるQD-SOA-MZIで構成した

干渉抑圧

　　　 Interference Suppressor in a SSFBG OCDMA using a

QD-SOA-based MZI

In this paper, we propose a method for suppressing interference in an super-structured fiber Bragg grating Optical Code-Division Multiple-Access (SSFBG OCDMA) system that uses a Quantum-Dot Semiconductor Optical Amplifier based Mach-Zehender Interferometer (QD-SOA-based MZI). The proposed suppressor comprises two QD-SOAs and couplers and can be composed as a small and power-efficient device. The device is used at the output of a correlator of a receiver. Input of the proposed device is two optical data, the output of SSFBG correlator and the control pulse.

The proposed device has two processing, time gate processing and threshold processing and these processing remains multiple-access interference (MAI). Time gate processing suppresses interference in chip positions (except from at the auto-correlation peak) owing to property of 3dB couple and MZI. Threshold processing enhances eye opening owing to Cross Phase Modulation, one of the nonlinear optical effect.

We evaluate performance by numerical analysis and simulation and use power contrast ratio (PCR) and extinction ratio (ER). We use coherent code like preferred gold code and A-family. Both ER and PCR is improved and the proposed device suppresses MAI. Also, we show comparison with the similar study which use means interference suppression using nonlinear optical effect. The proposed device is much shorter than any other studies because QD-SOA is short. So, the proposed device is suitable for access network like OCDMA. In addition, we show the effect of linewidth enhancement factor, delay of synchronous between the output of SSFBG correlator and the control pulse, another parameter QD-SOA and pattern effect.