















performance, the results showed that the all-fiber mode multiplexer based on the MSCs can be used in MDM transmission over a length of the few mode fiber.

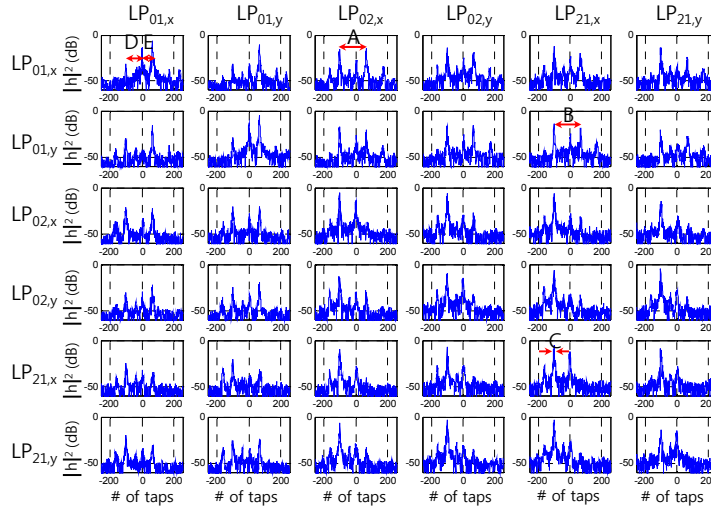


Fig. 7. Squared magnitude of the tap coefficients of 6x6 MIMO equalizers for 15 km of four mode fiber.

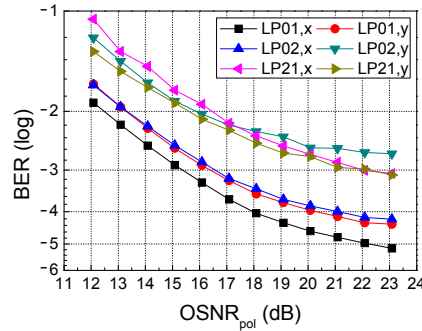


Fig. 8. BER curves after transmission over 15 km of four mode fiber. Three modes of LP<sub>01</sub>, LP<sub>21</sub>, and LP<sub>02</sub> were transmitted. x and y are denoted for each polarization. BER: bit error rate, OSNR<sub>pol</sub>: optical signal-to-noise ratio per polarization.

#### 4. Conclusions

In this work, we report the all-fiber mode multiplexer consisting of multiple consecutive MSCs. We have successfully demonstrated MDM transmission of 120 Gb/s PDM-QPSK signals on the three spatial modes over 15 km of four mode fiber using the all-fiber mode multiplexer and demultiplexer. The received signals were recovered by 6x6 MIMO signal processing. The experiments prove that the all-fiber mode multiplexer can be used as an alternative for the MDM transmission. Methods to produce more efficient MSCs while suppressing the crosstalk are under investigation.

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