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Radiation effects in silicon photonic modulators of the COTTONTAIL chip

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We report on results of irradiation experiments with ring modulators and Mach-Zehnder modulators of our current silicon photonic transmitter chip COTTONTAIL. Ex-situ experiments on ring modulators show a significant degradation from a total ionizing dose of more than 3 MGy and a difference in low and high frequency behavior. Forward bias annealing can mostly restore the pre-irradiation characteristics, but can leave a small penalty of up to 3 dB, even after extended annealing. In-situ experiments for continuous measurements while irradiating are currently prepared for ring modulators as well as for Mach-Zehnder modulators.

Speed talk:

I am unwilling/unable to present a speed talk

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