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Ultra low power consumption 10.7 Gb/s transmission over 2 km single mode fiber optics link

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In this work we demonstrate a digital error-free transmission ($\text{BER} < 1\text{e-}12$) at a bit rate of 10.7 Gb/s over a 2 km optical-link obtained with an ultra-low-voltage lithium niobate Mach-Zehnder modulator (LNM) driven by 0.6 Vpp and with 1 mW of optical input power at a wavelength of 1550 nm. Voltages in this range allow driving the modulator directly from the board and placing the optical active part of the link (e.g. signal lasers) outside the critical radiation area. This implies a strong reduction of components' number and power requirement in the "hot" zone. In such a scenario, lasers are some hundred meters away from the modulators and polarization issues along the laser-modulator connecting fibre link play a significant role, in particular if deployment of polarization maintaining fibres has to be avoided to reduce the system cost. We will present proposals and results aimed at employing single mode fibers (SMF) throughout the link (laser-modulator-detector) without increasing penalties due to polarization dependency. We also address the integration of the overall link presenting a low cost solution for laser-modulator subsystem.

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