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Radiation-Hard/High-Speed Parallel Optical Links (12' + 3')

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The LHC has recently been upgraded to operate at higher energy and luminosity. In addition, there are plans for further upgrades. These upgrades require the optical links of the experiments to transmit data at much higher speed in a more intense radiation environment. We have designed an ASIC that contains four high-speed/radiation-hard drivers to operate an array of four VCSELs at 10 Gb/s. The ASIC has been fabricated in a 65 nm CMOS process. We have also designed a new fiber optical transceiver that couples the ASIC to a VCSEL array. The optical transceiver had been exposed to an intense beam of protons to study the radiation hardness of the high-speed optical links. The irradiated devices will be extensively characterized after the radiation cool down. For the future, we plan to increase the number of channels to twelve. We will present the study of the radiation hardness of the new high-speed optical links together with the future plan.

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