# ABSTRACT

A photonic transceiver is an important part of an optical fiber communication network. It is used to convert baseband data suitable for transmission, as well as to down convert the received signal with minimal changes to its configuration. This thesis deals with the design of such a transceiver. First, a MZM based transceiver is analyzed and then simulated in OptiSystem7 simulation software. Then various measurements are performed to prove that it can operate as a linear device during both up as well down conversion process. Further, Third Order Intercept is extrapolated from the linear section to obtain the maximum extent of linearity of the device.

However, due to bias drift problem of the MZM device another transceiver design configuration is analyzed. This device uses polarization modulator to modulate polarization state of light, unlike MZM which modulates intensity of the light. Then the bias drift of the design is fixed using mechanical wave-plates, called polarization controller. Then analysis is performed similar to the MZM based transceiver.

In both the analysis, it can be concluded that both the devices perform linearly as required for the usage in a data transmission network. Further, BER analysis revealed that the devices are suitable for application in a fiber to wireless network without any degradation in performance. Also the devices operate at a low power and supports integration features allowing smaller space requirements and mobility.