

For the introduction of fast transmission system with data rates of 40 Gb/s and above polarization mode dispersion (PMD) is an important effect. Maximum transmission rates of optical fiber links will be determined by PMD, therefore it is crucial to measurement fast, precise and cost-efficient. In this thesis, a PMD measurement setup is presented. It allows to measure PMD within a few microseconds with a precision of about 1.35 ps. The measurement setup was successfully employed in a WDM transmission system. The measurement system is able to perform self-characterization and continuous optimization and could be used as a subsystem for future PMD compensation setups. The arrival time measurement could also be useful for a polarization multiplex transmission system. The arrival time measurement circuit also allows measurement of chromatic dispersion.