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## Using a VCSEL to Accurately Measure the Chromatic Dispersion in Single Mode Fibre by the Phase Shift Technique

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**Abstract content (Max 300 words)** [http://events.saip.org.za/getFile.py/?target=\\_blank](http://events.saip.org.za/getFile.py/?target=_blank) **Formatting & Special chars**

Abstract – The demand for high-speed data transmission and higher bandwidth is increasing rapidly due to the growing consumer need for advanced telecommunication technology. All fibre optic cables have an inherent factor limiting transmission, known as chromatic dispersion. Chromatic dispersion results in the broadening of an optical pulse with respect to time as it propagates along the fibre, leading to a rise in bit errors. In this paper, a method for characterizing the chromatic dispersion in single mode fibre is described. Our approach is based on the phase shift technique, in which the change in phase of sinusoidal modulated signals at varying wavelengths is measured. A vertical cavity surface emitting laser (VCSEL) source was implemented to characterize the chromatic dispersion along different lengths of G.652, G.655 (+) and G.655 (-) single mode fibre, around the 1550nm wavelength region. A dispersion coefficient D, between 16.5 ps/nm.km to 19.1 ps/nm.km for the G.652 single mode fibre, 2.6 ps/nm.km to 4.2 ps/nm.km for the G.655 (+) single mode fibre and -2.8 ps/nm.km to -3.2 ps/nm.km for the G.655 (-) single mode fibre was measured. The experimental results are in close agreement to those obtained in literature related to the characterizing of chromatic dispersion in single mode fibre.

**Apply to be considered for a student award (Yes / No)?**

Yes

**Level for award (Hons, MSc, PhD)?**

MSc

**Main supervisor (name and email) and his / her institution**

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**Would you like to submit a short paper for the Conference Proceedings (Yes / No)?**

Yes

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