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VCSEL Technology for Square Kilometre Array (SKA) Optical Fibre Network

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Abstract content
   (Max 300 words)

Square Kilometre Array (SKA) South Africa demands high transmission rates at reasonable cost because of enormous data rates. For the first time, we propose the use of Vertical Cavity Surface Emitting Lasers (VCSELs) within the optical fibre network supporting data collection and transmission. VCSELs are extremely cost effective, energy efficient optical sources ideal for relatively short distance high speed optical communication networks. VCSEL operation is however limited by wavelength chirp and chromatic dispersion. We have theoretically demonstrated VCSEL transmission over typical SKA required distances. We show that VCSELs are ideal for per-channel transmission rates of 2.5 Gb/s, 5 Gb/s and 10 Gb/s within SKA project. It is found that Bit Error Rate (BER) decreases with increase in power. This work is valuable in providing SKA with a VCSEL technology, option for extremely high network performance at reasonable cost.
Keywords:
Optical fibre communication, VCSEL, Dispersion, SKA.

Apply to be
 consider for a student
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YES

Level for award
 (Hons, MSc,
   PhD)?

PHD

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

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Would you like to
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YES

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