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Paper: Switchable multi-wavelength erbium-doped fibre laser for remote sensing

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Abstracts:

In this work, we present and experimentally demonstrate a switchable Erbium-doped fibre laser (EDFL) for remote sensing applications. The laser uses four Fibre Bragg Gratings (FBGs) for wavelength selection and for temperature sensing and a 2x4 optical switch. By adjusting the switch combinations, the laser can be switched among the four different wavelength lasing configurations. Stable one- and two- wavelength oscillations were achieved based on the use of this device. An output power instability analysis with the temperature for two different multi-wavelength configurations, one of them using the 2x4 optical switch and the other using a 1x4 coupler, was performed, for a cavity length of 50 km. A comparison between the performances of these topologies is carried out, and their temperature sensitivity and stabilization time are shown.

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