

**UNIVERSITI TEKNOLOGI MARA**

**PERFORMANCE AND STABILITY ANALYSIS OF  
MULTIWAVELENGTH FIBER LASER BASED ON  
HYBRID RAMAN-EDF IN CLOCKWISE AND  
ANTI-CLOCKWISE PROPAGATION**

**NOR AIN BINTI MD SAAD**

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## **ABSTRACT**

A performance and stability comparison of multiwavelength fiber laser based on Raman-Erbium doped fiber (EDF) in clockwise and anti-clockwise is demonstrated and analysis of the finding is conducted. By tapering a section of erbium doped fiber ends with two-taper successively and the configuration of the laser ring is based on clockwise direction, the fiber laser able to lased two lasing lines at wavelengths of 1558.8 nm and 1564.12 nm respectively. Both lasers exhibit a better performance with 47 dB of side mode suppression ratio (SMSR) and acceptable peak powers of -6.8 and -6.79 respectively for laser 1 and laser 2 comparing to anti-clockwise direction. For anti-clockwise direction, the laser able to lased single wavelength at 1562.32 nm with peak power of -27.34 dBm and SMSR of 34 dB. The laser also show high stability at room temperature with peak power variations less than 0.26 dBm for laser 1 and 0.67 dBm and wavelength drift less than 0.04 nm for both laser when observed for 2 hours of operations when injected with pump power of 666 mW.

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