An artificial neural network (ANN) based approach predicts the mean-time-to-failure (MTTF) of laser under different operating conditions with higher accuracy compared to the accelerated aging tests.

ANN Model for Laser Lifetime Prediction

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Case Study: 1550 nm InGaAsP MQW DFB laser

Electro-Optical Characteristics:
- \(-40 \degree C \leq T \leq 85 \degree C\)
- 1530 nm \(< \lambda \leq 1570\) nm
- 0.9 V \(< V \leq 1.3\) V
- \(P \leq 10\) mW
- SMSR > 30 dB

Dataset Overview
2539 samples

ANN Model
Two hidden layers:
- 1st hidden layer: 200 neurons
- 2nd hidden layer: 100 neurons

Conclusions
- A novel approach for laser lifetime prediction using ANN has been presented
- The proposed ANN Model outperforms the conventional laser lifetime projection method
- Higher accuracy and applicability to unseen operating conditions

Next Steps
- Collection of experimental or in-field data for the performance evaluation of the developed model

References