

### 9:35 - Nonlinear preamplification for interferometric $\varphi$ -OTDR

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The work presents an evaluation of a  $\varphi$ -OTDR preamplification method for the Rayleigh Backscatter light that employs linear and nonlinear preamplification stages to improve signal to noise ratio (SNR). The system increases the Rayleigh Backscattering trace minimum and average intensities by 170% and 70% respectively, improving the SNR for small signals.

### 9:50 - Demodulation of an LPFG sensor cascaded by a FBG sensor array machine learning

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In this work, we show the use of a fiber Bragg grating sensor array to demodulate a cascaded long-period fiber grating sensor using a machine learning model. We show the use of transfer learning from synthetic data training as a promising tool for calibrating machine learning models in optical sensing.