

# ARTÍCULO PUBLICADO

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Paper: Sample Fiber Bragg Grating Spectral synthesis

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**Abstract:** In this paper, a technique to estimate the deformation profile of a Sampled Fiber Bragg Grating (SFBG) is proposed and experimentally verified. From the SFBG intensity reflection spectrum, any arbitrary longitudinal axis deformation profile applied to a SFBG is estimated. The synthesis algorithm combines a custom defined error metric to compare the measured and the synthetic spectra and the Particle Swarm Optimization technique to get the deformation profile. Using controlled deformation profiles, the proposed method has been successfully checked by means of simulated and experimental tests. The results obtained under different controlled cases show a remarkable repetitiveness ( $< 50 \text{ } \mu\text{m}$ ) and good spatial accuracy ( $< 1 \text{ mm}$ ).