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## **Power modulated temperature sensor with inscribed fibre Bragg gratings**

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### Abstract:

The Fibre Bragg Grating (FBG) based temperature optical sensor has been designed and demonstrated. FBGs have been modelled and fabricated so as to convert the Bragg wavelength shift into the intensity domain. The main experimental setup consists of a filtering FBG and two scanning FBGs, respectively, left and right scanning FBG, whereby scanning FBGs are symmetrically located on the slopes of the filtering FBG. Such an approach allows for the modulation of power for the propagating optical signal depending on the ambient temperature at the scanning FBG location. A positive or negative change of power is determined by the spectral response of the FBG. Experimental research of the scanning FBGs' sensitivities emphasized that the key issue is the filtering FBG. A different level of sensitivity could be achieved due to the spectral characteristic of the filtering FBG. Omitting advanced and high-cost devices, the FBG-based temperature sensor is presented. The FBG-based sensor setup could yield resolution of 1°C for the range of temperature 0.5°C to 52.5°C. The experimental study has been performed as a base for an easy-placed sensor system to monitor external parameters in real environment.