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Paper: Resilient long-distance sensor system using a multiwavelength Raman laser

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Abstracts: This paper shows a long-distance remote sensing system using a multiwavelength Raman laser. The sensor network is based on a 50 km long standard single-mode fiber (SMF) and is composed of a simple cavity based on a loop mirror and four fiber Bragg gratings (FBGs) arranged in a star configuration. FBGs are used for both the sensing function and the selection of the lasing wavelengths. The system is designed to be inherently resilient to fiber failures. The multiwavelength laser has been characterized for temperature measurements showing a good stability performance.