

MEASURING TEMPERATURE WITH LIGHT AT NRC

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Abstract: For the last 100 years, the most accurate thermometers below 1000 °C were almost exclusively based on electrical measurements. Such thermometers are sensitive to mechanical shock, thermal stress, humidity and chemical contaminants, ionizing radiation damage and electromagnetic interference. These fundamental limitations have produced considerable interest in the development of temperature sensors based on frequency measurement which exploit the thermo-optic effect to translate thermal changes into frequency shifts as an alternative to their electrical counterpart. Photonic thermometers look like potential candidates to provide greater temperature sensitivity and accuracy while being robust against environmental changes. Here we report on the testing of one of the most promising types of photonic thermometers – commercial silica fiber Bragg grating thermometer.