



Aufgabenstellung im Projekt Feinwerktechnik WS 2007-2008

für Vorname Name 1, Vorname Name 2, Vorname Name 3

Thema: Characterization and reliability studies of Fiber Optic Sensors for high temperature applications

Zielsetzung:

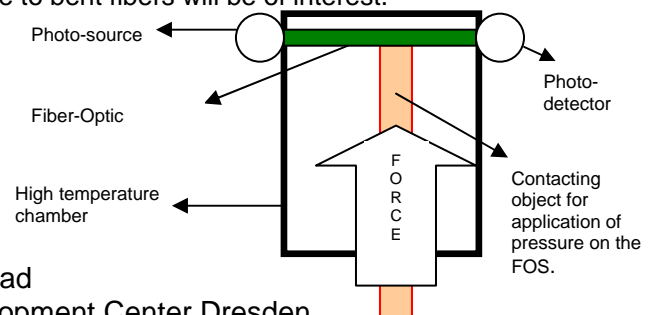
Fiber Optic sensor (FOS) is an interesting topic, in which current developments are directed towards new and exciting applications. Susceptance to EMI and noise-free output of the FOS makes them particularly attractive for high precision sensor applications.

This project will investigate the applicability of FOS to sense pressure in rugged environments, which involve very high temperatures. The tasks of the project are briefly illustrated by the following steps:

1. Initial characterization of the sensors for basic functionality by use of an infra-red optical source and a suitable detector.
2. Separation of material-related light loss and dimension related light loss by use of sensors in various shapes. (Straight, arched at different angles etc.)
3. Design and construction of the set-up (simple schematic shown below) within which the sensor will be mounted for pressure sensing within a high temperature chamber.
4. Realization of #3 and checks to determine the stability of the arrangement.
5. Tests to compare different types of sensors (built with varying configurations, meant for high temperature applications) within the HT chamber, as a function of temperature and pressure.
6. Variation of surface profile on the side of the pressure-inducing object that contacts with the sensor. (Flat, V contact, W contact; Further details will be provided).
7. Reliability testing of the sensors until their end of life. Combined effect of repeated application of force on the sensor body and the high temperature will damage the sensors. Possible decrease in accuracy due to bent fibers will be of interest.

Intended Conclusion:

- To validate the high temperature capability of FOS.
- To propose the FOS configurations and its mounting shapes for optimum pressure monitoring.



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