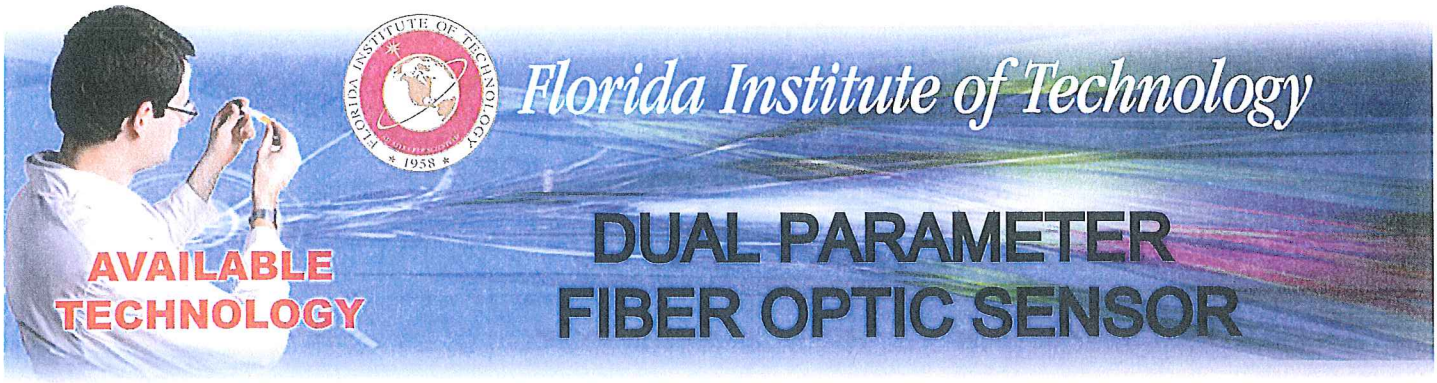

Summary

We have designed a novel three-mirror sensor that measures two independent parameters such as hydrogen concentration and the temperature simultaneously. The three-mirror sensor has the ability to extract two sets of parameter measurements simultaneously with a single sensor head and single wavelength, thereby minimizing system cost and complexity and increasing accuracy since both parameters are measured at the same spatial location.

Applications

- Because the sen-sor is ultrasensitive, it can be used for leak detection applications as well as hydrogen monitoring applications.
- This architecture allows for the simultaneous detection of hydrogen and temperature while eliminating the need to have multiple sensors.
- Since most sensors are sensitive to other variables besides the desired one, our technique is beneficial to almost all sensing applications.

Advantages

- Ideally, the fiber-optic switches that are employed would be wave- length independent and compatible with such SM systems. Unlike most switches, ours is!

The Technology

Most fiber-optic systems employ a Dense Wavelength Division Multiplexing (DWDM) scheme, sending information over single mode (SM) fibers. The AFOS is constructed with a multimode fiber spliced between two SM fibers used as modal filters. When the multimode fiber is subjected to a periodic strain field, light leaks out of the fiber, reducing the propagating light. The modal filters enhance the resulting extinction ratio. Our AFOS has a combination of distinct advantages not found in any other single device.The AFOS was optimized and characterized for use as a continuously variable attenuator and as an optical switch/modulator. The AFOS is wavelength independent over the SM wavelength bands, is simple in construction and has a measured extinction ratio of more than 80 db. Optimization of the device and design for manufacturability are the next steps in the device development.

Florida Institute of Technology Contact:
Assistant Vice President for Research
John P. Politano Jr.
321-674-7239 /Jpolitan@fit.edu

Florida Tech Inventor: Dr. Barry Grossman