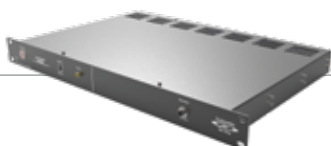
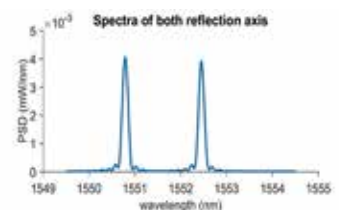
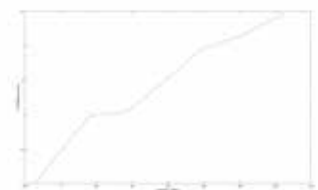


MULTI-POINT, MULTI-PARAMETER SENSING

Yearly 1.3 million people undergo an angioplasty treatment where a narrowed blood vessel (stenosis) in the coronary arteries is treated. Conventionally this diagnosis is made with X-ray imaging of the blood vessel in combination with a contrast fluid put into the arteries. This contrast fluid is highly visible on the x-ray images and indicates the level of blood flow reduction.

Treatment is based on visual inspection by the cardiologist. Although trained in this type of procedure, unnecessary treatments are common. A method to quantify these stenosis (e.g. the blood flow reduction) lacks. Fiber optic sensing has high potential in medical applications. An increasing number of parameters can be monitored with optical fibers. With the use of an FBG in a Microstructure Optical Fiber (MOF) blood pressure sensing becomes possible. The reflection of the FBG in the MOF contains two center wavelengths.

Whereas temperature and strain causes an identical shift of these two peak, changes in pressure causes these peak to shift with different sensitivity; resulting in a change in spectral separation. This parameter, the peak difference, can be used for blood pressure sensing. In experiments at Technobis the pressure was changed from 0 to 1.4 bar resulting in a spectral separation between the two peaks of 1.6 pm per bar. The Technobis **Gator** platform allows this technology to be integrated in a guidewire for use in cardiac stenosis treatment for accuracies in the order of 1 mbar / 0.75 mmHg.



OEM LadyGator

Julius Zonneveld
Development Engineer
Julius.Zonneveld@technobis.com

