temperature sensitivity, it is similar to the one obtained with a silica tube based configuration [18].

Table 1. Strain sensitivity for different cavities structure

Structure Type	Strain Sensitivity	Cavity Size	References
Spheroidal cavity	~10.3 pm/με	10x60 μm	[12]
Suspended-core fiber	1.32 pm/με	~0.84 mm	[3]
Spheroidal cavity + PCF	2.7 pm/με	58 μm	[11]
Hollow tube	0.59 pm/με	40 mm	[21]
Hollow-core PCF	2.3 pm/με	30 mm	[20]
Photonic crystal fiber	6 pm/με	~80 μm	[13]
Hollow-core ring PCF	15.4 pm/με	13 μm	This work

4. Conclusion

Summarizing, a study of the Fabry-Pérot (FP) cavity length dependence towards strain measurements was performed. The FP cavity was based on a hollow-core ring PCF and its manufacturing was quite simple. The two-wave interferometer obtained presented an increase of strain sensitivity as the FP cavity was reduced. The 13 μm long FP cavity exhibited a sensitivity of 15.43 pm/με, which is one of the highest values reported so far. A study of the dependence of the strain sensitivity upon total length variation was also done. Even though this value was not highly influenced by the mentioned parameter, higher total lengths originated better strain sensitivity. When compared to other papers, this structure has achieved an increase of ~50% of strain sensitivity. This configuration can be used to measure different parameters, namely pressure, axial deformation as well as other parameters with indirect measurement to strain. Finally, the FP cavity exhibited low thermal sensitivity.

Acknowledgments

This work was supported in part by the COST Action TD1001 and FCT – Fundação para a Ciência e Tecnologia under the grant SFRH / BD / 76965 / 2011.

#172567 - $15.00 USD Received 16 Jul 2012; revised 22 Aug 2012; accepted 23 Aug 2012; published 11 Sep 2012