

Modeling of the Distributed Fibre-Optical Sensor in Labview for Increasing of the Spatial and Temperature Resolution

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Abstract. The distributed temperature sensors are often used in systems of technogenic monitoring and measurement technique. The metrological characteristics of such devices demand improvement. It is connected with improvement of data asquisition and algorithms of digital signal processing. In the paper, the modeling of distributed temperature sensor in Labview is carried out. A new approach to improvement of characteristics, consist in digital filtration and use of median evaluation of signal instead of average value is offered.

Key words: Bragg temperature sensor, fiber optics, spectrum characteristics, modeling in Labview

REFERENCES

- [1] Z.N. Alekseenko, O.V. Stukach. Design of the monitoring system based on sensor on Bragg fiber array for the objects with large infrastructure [Electronic]. Youth and modern information technologies: Proceedings of the XII All-Russia scientific-practice conference of students, post-graduates and young researches: in 2 v., Tomsk, November 12–14, 2014. TPU. Vol. 1. P. 335-336. http://www.lib.tpu.ru/fulltext/c/2014/C04/V1/C04_V1.pdf
- [2] A. H. Hartog. A distributed temperature sensor based on liquid-core optical fibers. *Journal Lightwave Technol.* 1983. N 1. P. 498–509.
- [3] J. P. Dakin, D. J. Pratt, G. W. Bibby, J. N. Ross. Distributed optical fiber Raman temperature sensor using a semiconductor light source and detector. *Electron. Lett.* 1985. № 21. C. 569–570.
- [4] X. Bao, D. J. Webb, D. A. Jackson. Combined distributed temperature and strain sensor based on Brillouin loss in an optical fiber. *Opt. Lett.* 1994. № 19. C. 141–143.
- [5] B. Culshaw. Optical fiber sensor technologies: opportunities and-perhaps-pitfall. *J. Lightwave Technol.*, vol. 22, no. 1, pp. 39-50, 2004.
- [6] J. Park *et al.*, Raman-based distributed temperature sensor with simplex coding and link optimization. *Photon. Tech. Lett.*, vol. 18, no. 17, pp. 1871-1881, 2006.



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