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## Jacket effect on strain measurement accuracy for distributed strain sensors based on Brillouin scattering

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### Keywords

fiber optics sensors, Brillouin scattering, strain monitoring, jacket effect

### Abstract

Fiber jacket has a function of protecting fibers from harsh environment; it also has an impact on the measured strain accuracy. In this paper, we report on our study of jacket effect to distributed Brillouin sensor system on strain measurement accuracy for constant load stretching and constant length stretching using the 900  $\mu\text{m}$  tight-buffered fiber (Type-A) and the 250  $\mu\text{m}$  optical fiber (Type-B). We have studied the time-varying performance under the stretching of constant load and length. It was found that, within 48 hours under constant load stretching, the strain value of the Type-A measured by BOTDR (Brillouin optical time-domain reflectometer) increased with time, while the Type-B it kept stable. Within 48 hours under constant length stretching, the strain value of the Type-A decreased with time, while the Type-B it kept stable. After relaxation, the strain value of the Type-B reached zero within 1 hour, while the Type-A declined gradually. We found the creep deformation and stress relaxation of jacket to be the leading cause to this phenomena.



282.3 kB

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