

FIBER OPTIC DISTRIBUTED SENSING SYSTEMS

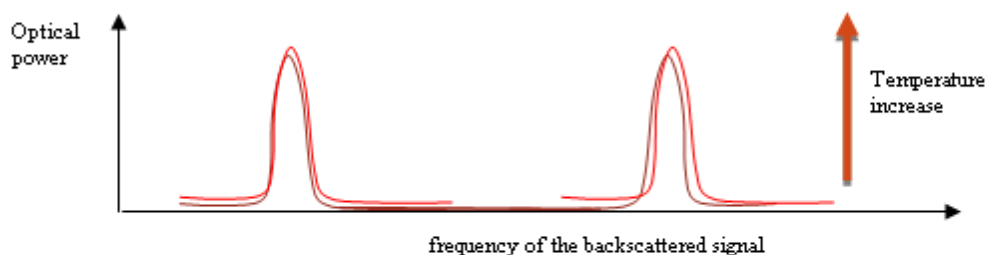
Using of Raman and Brillouin scattering in DSS systems.

Why Raman and Brillouin scattering?

- Raman scattering and Brillouin scattering are influenced by two fiber parameters – from the internal fiber tension, which is influenced by pressure, tension or vibrations and of the fiber temperature.
- The detailed analysis of these two effects shows that it is absolutely possible to make apparatus for distributed measuring of temperature, pressure, tension or vibrations using OTDR and measuring the wave length and the power of the reflected back signal as a result of the Raman and Brillouin effects.
- At the base of this systems for distributed measuring - DTS or DSS is the fact that the reflected back light due to the Brillouin (BS) or Raman (RS) effects is the information carrier for temperature or mechanical changes.
- **In this case the optical fiber itself is used as a sensor.**

Basic effects when measuring the temperature and strain

Temperature change influences both the backscattered power and frequency of the backscattered signal



The changes of internal fiber tension leads to changes only to frequency of the backscattered signals.

