



The processes of registration seismic waves , using fiber laser

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The present course describes a theoretical and experimental modeling of registration seismic waves [1], application of optical fibre sensor whose sensitive is made on the basis of two Mach-Zender interferometers. The measuring and reference channels of the device are made in the form of signal-mode lightguides with w-profile, which retain the polarization of light. The effect of seismic pressure leads to axial compression of the w-fiber guides in the measuring channel. The measured signal is recorded by the relative displacement of the structure of the interference pattern, which is caused by phase modulation of a coherent light wave [2] propagating in the measuring channel. It has been demonstrated that the method based on calculation of the mutual correlation function [3] of the output signals of the interferometers makes it possible to raise the signal/noise ratio of the device by eliminating irregular noise waves and reproducing an accurate shape of the measured seismic pressure signal. As the light source, we have used single-frequency semiconductor injection laser which external resonator was used and one of a resonator mirrors was the w-lightguide end with reflection structure deposited on it. The w-lightguidess had the cut-off wave length 1,1 μm , the degree of retention of polarization 99 %. Described model is applied for seismic monitoring in deep boreholes, volcanoes, in harsh environment-high temperature, pressure, chemically aggressive media, using telecom fibres. REFERENCES 1. Yu.I.Rzhavin et al., Radiotekhnika and Elektronika, 1991, v.36, No 3 ,pp. 625-627 2. Yu.I .Rzhavin Proceeding SPIE, 1994, vol. 2349, pp.154-157 3. Yu.I.Rzhavin Proceeding SPIE, 2002, vol.4827, pp.253-257