Evgenii Anikin et al., Int J Earth Sci Geol. 2019
http://dx.doi.org/10.18689/2642-1569.a2.002

High-Sensitive Low-Noise Seismic Sensor of Angular Motions on Molecular-Electronic Technology

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High-precision seismic angular motion sensors are capable of substantially change the instrumentation base of modern seismic. The use of such sensors in composition of modern seismic complexes will increase the efficiency use of natural resources, accelerate exploration, reduce their cost, increase the reliability of the data obtained due to higher sensitivity and ease of use. Also angular motion sensors, despite the targeted focus on the seismic, can be successfully used to solve the problems of structural health monitoring (SHM) and also be used to protect extended territories. For use in seismology angular motion sensors should have a sensitivity of about 10^{-8} rad / s / √Hz and low sensitivity to linear movements. Today does not exist devices meeting these requirements.

We conducted a theoretical calculation and an experiment to measure the self-noise of an angular motion sensor based on molecular-electronic technology (MET) with a modified configuration of the electrode grid and connected electronics in the practically important frequency range of 1-100 Hz.

We proposed technical solutions for development an angular motion sensor based on molecular-electronic technology with a record low level of self-noise (about 10 -9 rad / s / √Hz).

This work was financially supported by the Ministry of Science and Higher Education of Russian Federation under statement #3.3197.2017/ПЧ and by the Russian Foundation for Basic Research under statement #18-55-06021-Аз-а.

Biography:

Anikin Evgenii was born in Ulyanovsk, Russia in 1995. He has received a bachelor's degree at the Moscow Institute of Physics and Technology (MIPT) in the field of applied mathematics and physics in 2017. He is the winner of the competition "UMNIK" 2017 from Innovation Promotion Fund. In 2018, he has participated in the plenary session from the Russian side at 3rd BRICS Young Scientist Forum BRICS (South Africa). He currently works as research assistant in the Center for Molecular Electronics at MIPT since 2016. Research interests include electronics, hydrodynamics, electrochemistry, applied physics, seismology and signal analysis.