

LITERATURE REVIEW OF FIBER-OPTIC SYSTEMS FOR VEHICLE WEIGHT-IN-MOTION MEASURING

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When studying scientific literature, knowledge of English is extremely important since advanced foreign technologies can only be studied by knowing the language. For example, a system for measuring the weight of a vehicle in motion will make it possible to weigh vehicles on the go. The operation scheme of the system will be implemented using fiber Bragg gratings. An analogue of such a system is already presented on the EU market, but for Russia this work is extremely relevant.

Introduction. In today's digital world, scientists have access to a wealth of information, and teams from different parts of the world can work independently on the same problem. Scientific conferences, internships and, of course, scientific articles are excellent means of communication for scientist. English is an international language not only in the political world, but also in the scientific one. Many scientists publish important results not in their native languages, but in English so that the whole world can know about their achievements! Thus, English is a great tool for scientists to share their ideas worldwide, therefore, the main requirements for scientists when writing a scientific article are accuracy, clarity, consistency, and knowledge of certain terminology when publishing their thoughts. One of the debated topics today is the development of a system for measuring the weight of a vehicle in motion. Such a system will allow weighing vehicles on the go. The importance of trucks weight control has been repeatedly discussed in road construction enterprises since the weight of trucks influences the safety of traffic, the roadbeds and road infrastructure. To control the weight of vehicles, stationary weight control posts are used, and a new Weigh-in-motion (WIM) system will allow detecting a moving object and assessing the impact on the roadway.

Main part. It is proposed to implement the WIM system using fiber-optic sensors based on fiber bragg gratings (FBG). Most modern foreign WIM systems use piezoelectric sensors that generate electrical voltage when mechanically applied to them. However, systems based on the use of piezoelectric sensors have such disadvantages as low mechanical strength (their service life is less than two years) and they are temperature dependent. There are three main characteristics of modern sensors. They should provide higher measurement accuracy, be insensitive to acoustic noise and magnetic influences, operate in harsh operating conditions and be of moderate cost. The optimal solution for the implementation of a weight control system for a vehicle in motion is a system based on fiber-bragg gratings. FBG is a periodic structure formed in the core of an optical fiber. The principle of operation is since the system behaves as a selective reflective element, in which the wavelength of the reflected light (signal) depends on the impact on the FBG. Thus, under pressure, in our case, a vehicle hits the area under which the fiber-optic sensor is located, the wavelength of the reflected signal changes, which is recorded by the receiving device.

Conclusions. As specialists of foreign companies emphasize, the use of fiber-optic systems allowed them to reduce the time for installing sensors in the roadway, obtain new information

and collect statistical data on traffic flows on the routes, analyze data on the load on various sections of the road and, possibly, predict the occurrence of a "rut" depending on traffic intensity.

The literature review, which was carried out as part of this work, consists exclusively of English language literature.