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CORRELATIVE ANALYSIS OF NOISE PROPAGATION

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Abstract. Noise created by traffic is one of the major problems of environmental quality in Europe. It is related to an increasingly growing dissatisfaction of the public with the current situation. In most cities, noise increases, on the average, by 1 to 3 dBA per year. In accordance with the data of the European Federation for Transport and Environment, around 200 million of persons suffer from noise caused by traffic. Acoustic pollution created by all types of vehicles is divided into air (noise) and structural (vibration) pollution. Noise generated by vehicles depends on a number of reasons: driving speed, technical condition of vehicles, traffic intensity, tyres, road paving, etc.

The most accurate method for evaluating noise levels in the environment is noise level measurement. Measurements of sound vibrations produce a number of digital signal results which are processed by applying the techniques of mathematical statistics and the theory of wavelet functions.

The aim of the work: to perform measurements of the equivalent and maximum noise levels in the established places of measurements during different times of the day and different seasons of the year and to compare the obtained values as well as to identify estimates of the interrelated covariance functions of digital data arrays and the auto-covariance functions of individual digital arrays.

The article examines an analysis of the noise level measurements performed in the territory of Raseiniai district municipality and its parameters by applying the theory of covariance functions. The results of measurement of a noise level in individual points were represented in the form of arrays (matrixes) by recording the maximum and equivalent noise level values. The estimations of digital arrays of noise level measurement of interrelated covariance functions and the individual digital arrays of auto-covariance functions were identified. The highest noise level values in Raseiniai town were determined in the measurement places situated at a distance of up to 20 m from busy streets, while the highest identified levels of noise reached up to 80 dBA. The variation of the interrelated covariances and auto-covariances of noise level arrays within the scale of distances and time by applying the designed software in the KorEs.m Matlab7 operator package environment is presented.

Keywords: covariance function, quantisation interval, sound level.

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