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Developing 3 dimensional model for estimation of acoustic power in urban pathways in geo-spatial information system framework

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Abstract

Around the word, traffic growth is causing growing air and noise pollution. Noise levels in a given area are affected by traffic on the streets as well as effective factors, including existing infrastructure and industrial centers, and so on. The purpose of this research is to model and estimate the amount of acoustic emission in the streets of Tehran's third district, using the 3D spatial information system. In this research, effective parameters on noise emission such as air absorption, distance, absorption by earth and the like are modeled with the help of the spatial information system. A three-dimensional map is presented to illustrate the distribution of noise in space, taking into account the above parameters. A hybrid model has been used to account for the noise reduction behavior of objects in reducing noise. Modeling and mapping of noise reduction, due to objects, in 3D space are calculated with higher accuracy, and are shown. The three dimensional maps presenting the noise levels, have proxided better understanding and helpful information of existing noise distribution status. Evaluations indicate the validity of the proposed hybrid model.

Keywords: Noise, GIS (Geo- Spatial Information System), 3 dimensional map, Acoustic, Building.

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