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基于GIS的2.5维场地地震液化势概率评价 [\(PDF\)](#)

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Title: Probabilistic estimation of seismic liquefaction potential for 2.5 dimensional site based on GIS

作者: 汤皓; 陈国兴
南京工业大学岩土工程研究所, 江苏南京210009

Author(s): TANG Hao; CHEN Guo-xing
Institute of Geotechnical Engineering, Nanjing University of Technology, Nanjing 210009, China

关键词: 场地; 地震液化势; 砂土; 液化概率判别法; Kriging插值法; 2.5维GIS; 可视化模型

Keywords: site; seismic liquefaction potential; sand; liquefaction probabilistic estimation method; Kriging interpolation method; 2.5 D GIS; visualized model

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摘要: 用具有概率意义的饱和砂土抗液化强度经验公式对2.5维工程场地进行了地震液化势概率评价,通过Kriging法对目标场地区域进行空间插值,可以对大区域工程场地的液化深度和液化范围进行分析评价;采用不规则三角网表面和四面体综合法共同描述地质体模型,在GIS的3维分析模块支持下建立了液化势可视化模型。研究表明:Kriging法通过已勘测点的土层地震液化势来估计未勘测点的土层地震液化势,能够较好地区划出场地地震液化势的空间分布特征,并对待估点进行预测;利用GIS的3维分析模块,实现2.5维场地地震液化势可视化模型的建立是一条有效技术路线。

Abstract: The empirical equation of cyclic resistance ratio of saturated sands with different probability level is utilized to evaluate the earthquake-induced sand liquefaction for 2.5D(2.5-dimensional) engineering site. By the Kriging interpolation method, the identification of sand liquefaction locality of the site can be estimated based on the evaluated results of liquefaction potential at the observation boreholes. Sustained by GIS 3D module, TIN(triangulated irregular network) surface and tetrahedron model are adopted to simulate the geologic body and realize the visibility of liquefaction potential for 2.5D engineering site. The research results show that (1) The Kriging interpolation is an effective method to estimate the liquefaction potential of the unidentified points by the evaluated liquefaction potential results of the observation boreholes. Therefore, it is a preferable way to evaluate the possible liquefaction range for engineering site. In addition, it has a bright application prospects in geotechnical investigation; (2) GIS 3D module is an effective way to realize the establishment of visibility

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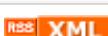
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model for site liquefaction potential. Therefore, the research on the 3D visibility for site liquefaction potential based on GIS is worthy of the further discussion.

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作者简介:汤皓(1980-),男,博士研究生,主要从事GIS在岩土地震工程与防灾减灾方面的应用研究.E-mail:th_njut@126.com