[1]汤皓,陈国兴.基于GIS的2.5维场地地震液化势概率评价[J].自然灾害学报,2007,02:86-91.

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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

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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的技术路线。

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

参考文献/REFERENCES

[1] 周小文,付晖,吴昌瑜.地层特性随机场插值方法应用研究[J].岩土力学,2005,26(2):221-224.
[2] 王靖波,潘懋,张绪定.基于Kriging方法的空间散乱点插值[J].计算机辅助设计与图形学学报,1999,11(6):525-529.
[3] Youd T L,Idriss IM.Liquefaction resistance of soils:summary report from the 1996 NCEER and 1998 NCEER/NSF work shops on evaluation of liquefaction resistance of soils[J].Journal of Geotechnical and Geoenvironmental Engineering,ASCE,2001(4):297-313.
[4] 陈国兴,李方明.基于径向基函数神经网络模型的砂土液化概率判别方法[J].岩土工程学报,2006,28(3):301-305.
[5] 汤皓,陈国兴,邵进达.基于GIS技术的场地地震液化风险评估系统——初步研究[J].自然灾害学报,2004,13(5):123-127.
[6] 李方明,陈国兴,从卫民.淮安市砂土地震液化势的综合评估[J].防灾减灾工程学报,2005,25(2):216-221.
[7] 汤皓,陈国兴.用ANN模型扩展COMGIS系统的地震灾害模拟仿真功能[J].系统仿真学报,2006,18(S2):587-590,594.
[8] 汤皓,陈国兴,李方明.基于ANN和GIS耦合模型的场地地震液化势评价系统研究[J].岩土力学,2006,27(S):1007-1012.

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