考虑地震力的刚体极限平衡法及其工程应用

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摘要　　在斜坡稳定性分析中，地震力偏角对斜坡稳定性的影响极大，但水平方向并不是最危险地震力作用方向，如何合理简单地求取地震力，并参与条分计算，是一个值得研究的问题。针对规范中拟静力法的地震力作用方向为水平方向，提出考虑地震力最危险方向的计算方法。以不平衡推力法为例，对考虑地震力的刚体极限平衡法进行改进，并应用于三峡库区兴山县高阳镇核桃树沟滑坡稳定性评价。结果表明：桃树沟滑坡最危险的地震力作用方向为指向坡外与水平面夹角为7.8°，最安全的地震力方向为187.8°；桃树沟滑坡在库水位175 m以及叠加6度地震时，滑坡的稳定性系数在0.9以下，滑坡处于失稳状态，需要对该滑坡进行治理。

关键词　　边坡工程；滑坡；稳定性评价；地震力；刚体极限平衡法

分类号

RIGID LIMIT EQUILIBRIUM METHOD CONSIDERING SEISMIC FORCE AND ITS APPLICATION

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Abstract

The influence of deflection angles of seismic force on slope stability is great in analysis of slope stability. However，the horizontal direction of seismic force is not the critical direction of seismic force. How to solve seismic force and to calculate the slope stability is worthy to be studied. Aiming at that the pseudo-static method in present standard takes the horizontal direction as the action direction of seismic force，the calculation method considering the critical direction of seismic force is put forward. Taking the imbalance thrust force method as an example，the rigid limit equilibrium method considering seismic force is improved and applied to stability evaluation of Taoshugou landslide，which is located in Gaoyang town，Xingshan County in the Three Georges reservoir area. The result shows that the included angle between the critical direction of seismic force and the horizontal plane is 7.8°and directs to the out of the slope. The safest direction is 187.8°. The stability factor of Taoshugou landslide is less than 0.9 under 175 m reservoir water level and earthquake with magnitude 6. Thus Taoshugou landslide is unstable and needed to be urgently prevented.

Key words　slope engineering；landslide；stability evaluation；seismic force；rigid limit equilibrium method

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