■ 论文摘要

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散体结构边坡体振动波传播机理

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摘　要：通过浅层振动波在散体结构边坡体的传播测试实验,得出以下传播衰减规律:振动波的波速、加速度、主频与爆源药量正相关,与爆源距离负相关;$v_p > v_s$, $\alpha_p > \alpha_s$;延迟时间数据的离散性高;低频成分所占权重大.在Kelvin模型假设的基础上,分析并给出了小变形条件下粘弹性介质中的波动方程,以及纵波和横波的衰减系数复数形式表达式,从而得出:粘弹性散体介质波的衰减与频率正相关;介质的密度差、孔隙度K0、充填物、透过因子是振动波衰减的关键因素;散体结构边坡体相当于一个滤波器,随爆源距离的增加,高频成分被吸收,频谱变窄,主频振动的延续时间延长.

关键字：散体结构;边坡体;振动主频; Kelvin模型;波动方程;衰减

The mechanism about vibrating wave transmitting on the granular structure slope

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Abstract: Based on the results of shallow-layer vibrating wave transferring on the granular structure slope, vibrating wave velocity, acceleration and main frequency have positive correlation with quantity of dynamite; negative correlation with distance from the explosion sources; $v_p > v_s$, $\alpha_p > \alpha_s$; data of delay time has high dispersing, low frequency has great contribution to vibrating frequency, etc. Through the hypothesis of the Kelvin model, the wave equation in the condition
of less distortion in the sticky elasticity, attenuation coefficient expression of vertical and transverse wave are analyzed. The results show that attenuation of sticky elasticity wave has positive correlation with frequency. Density of medium, interspaces degreeK0, filling, permeationgene are key ingredients; mediums of granular structure slope can be regarded as
a filter. High frequency is absorbed, frequency pedigree chart becomes narrow, and delay time of main frequency gets longer with the increase of distance from explosive sources.

Key words: granular structure; slope; main vibrating frequency; Kelvin model; wave equation; attenuation