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# 日本地震实时监测系统中液化识别方法可行性研究

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Title: Feasibility of liquefaction detection method in SUPREME of Japan

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关键词: [地震超高密度实时监测](#); [液化识别](#); [Suzuki方法](#); [液化场地](#); [软土地地](#)

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摘要: 日本地震超高密度实时监测系统(SUPREME)建设中的核心技术之一是依据强震记录对液化场地进行反演识别,系统中目前使用的是Suzuki法,但实际应用效果并不理想。选取不同地震下多种类别场地上的实际地震记录,对Suzuki法的适用性进行了研究,讨论了其不同指标对不同类别场地识别结果的影响。分析表明:Suzuki法对不同类别非液化场地的识别能力不同,最显著的缺陷是易将软土地地与液化场地混淆;方法所使用的4个识别指标中,过零周期为控制参数,其它指标仅起到初判作用;方法出现误判的原因是液化场地的过零周期范围与非液化中软土地地上的过零周期范围存在明显交叉,而这一点理论上是无法避免的客观存在;改进的方法是应放弃现有进行绝对值对比的做法,改用地震动某些参数的相对变化作为新的识别指标。

Abstract: One of the key techniques in the SUPREME of Japan is the liquefaction detection using strong motion records. The existing liquefaction detection technique employed in the SUPREME is the Suzuki' s method, but it is not very effective in application. In this paper, seismic records from various types of sites were selected to investigate the suitability of Suzuki' s method. The effects of various parameters on the detection results of different sites were analyzed. The results indicate that, the detection ability of the Suzuki' s method is different for different sites, and the notable shortcoming of the method is that it can not distinguish the soft sites and the liquefied sites. For the four parameters in the method, the control one is the zero-crossing period and others only play the role of initial identification. The reason of confusion between the soft sites and the liquefied sites is that the range of zero-crossing periods in soft soil and the liquefied sites are overlapping, which exists in fact and cannot be avoided.

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Therefore, the best way is to use the relative values of certain parameters in ground motions instead of the absolute parameters in the existing method.

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