

Dynamic monitoring and online automatic modal parameters of a super high arch dam

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Abstract: Laxiwa arch dam is a 250m-high arch dam in north-west of China, and it is being monitored by a dynamic monitoring system that comprise 25 sensors, which is mainly used to recorder earthquake. This paper focus on the automatic modal identified algorithm based on covariance driven stochastic subspace identification method (SSI-COV) and DBSCAN clustering algorithm. The first five modes during seven months from 2016/06/04 to 2016/12/31 are successfully tracked, and the effect of water level and temperature is discussed. The results show that the first two modes of Laxiwa arch dam are not closely, and the first mode shape and the fourth mode shape are very similar in the top crest. Compared with the water level, temperature has a greater influence on the natural frequency, and it is positively correlated with temperature. At the end of the paper, the frequencies obtained using an earthquake recorder and a numerical model is developed to verified the identified results.

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