EXPERIMENTAL INVESTIGATION OF PRESSURE FLUCTUATIONS ON THE BED OF FLIP BUCKET SPILLWAYS

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Abstract

Hydrodynamic pressure fluctuations and their roles on the design of hydraulic structures has been the subject of many investigations. The studies showed that turbulent pressure fluctuations may cause serious damages to hydraulic structures. In case of high velocity flows, separation of flow from the boundary also causes the local pressure to drop and as a result, the resultant pressure fluctuations may trigger cavitation. Sever hydrodynamic pressures are also associated with the vibration of structures. Therefore, in this work, experiments were performed to determine the intensity of pressure fluctuations and their distribution along the bed of a ski-jump flip bucket. Experiments were completed on a physical model at the Institution of Water Research of Iran. The results consist of the statistical characteristics of pressure fluctuations, its maximum, minimum, and *r.m.s* values along the bed of the bucket. The spectral analysis of pressure fluctuations which is useful for the instability analysis of such structures is also provided. It is hoped that the present results will help the designer of such structures.

Keywords: Flip-Bucket, Stochastic Characteristics, Pressure Fluctuations, Chute

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