论文类成果

关于高坝挑流消能和局部冲刷深度的一种估算方法

【创新性】

论文针对高坝挑流消能的泄洪冲刷问题，首次从水体消能的角度提出冲刷坑的估算公式（陈椿庭冲刷公式）。明确了消能水体体积是决定稳定冲刷坑深度的主要因素，提出了冲坑深度的估算方法。这是对传统认知的颠覆，为冲刷深度的估算提供了新的思路。论文同时给出了挑流射程的计算公式和冲刷坑后坡的计算公式。这些开拓性的工作都被工程界所采纳，被后来的研究者大量引用和参考。

【影响力】

50 余年来，陈椿庭冲刷公式因其形式简捷，物理概念清晰，已经在全国广泛应用。这种冲刷深度估算方法已写入高校教科书、《水力计算手册》，编入《重力坝设计规范》、《拱坝设计规范》等与高速水流冲刷有关的设计规范，在行业中占有重要地位。该论文的发表，使挑流消能在工程中得以广泛应用，为学科发展和行业进步做出了巨大贡献。论文于 1978 年获得全国科学大会奖，2016 年入选《水利学报》百篇经典论文。

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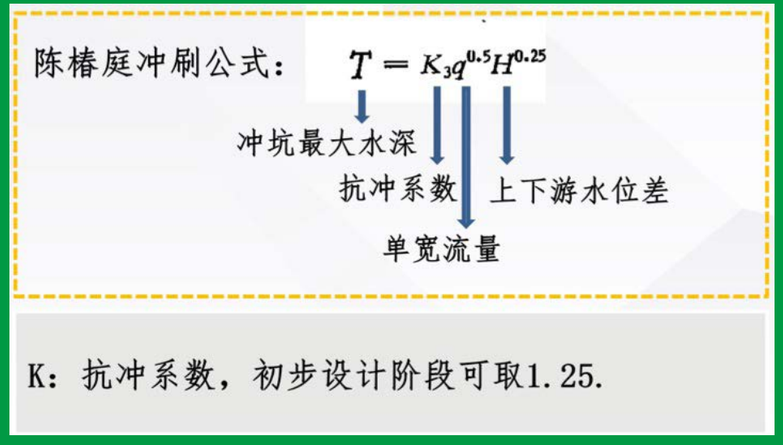

AN ESTIMATION METHOD FOR TRAJECTORY BUCKET TYPE ENERGY DISSIPATION AND LOCAL SCOURING DEPTH OF HIGH DAMS

【Innovation】

Directed at the flood souring of trajectory bucket type energy dissipation in high dams, the paper presents the estimation formula (Chen Chunting scouring formula) of scouring pits from the perspective of energy dissipation in water for the first time. It states the volume of water with energy dissipation is a major factor that determines the depth of scouring pits, and presents an estimation method for depth of scouring pits. This overturns traditional cognition, and provides a new train of thinking for the estimation of scouring depth. The paper also presents the calculation formula for the range of trajectory bucket and the back slope of scouring pit. These pioneering achievements are adopted by many hydro projects, and widely cited and referred by following researchers.

【Influence】

The Chen Chunting scouring formula has been widely applied across China for 50 plus years because of its simple form and clear physical conception. This scouring depth estimation method has been included in textbooks of colleges and universities, the Handbook of Hydraulic Computation, the Design Specification for Gravity Dams, the Design Specification for Arch Dams and other design specifications related to high-velocity current scouring, taking an important position in the industry. It enables the extensive application of trajectory bucket type energy dissipation to projects, and makes great contributions to scientific development and industry progress. It won the National Science Conference Award in 1978, and was included in the one hundred classic theses of the Journal of Hydraulic Engineering in 2016.

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