

**Simulation experiment of a new technology  
of pre-stressed concrete lining in pressure tunnel**

HUANG Hao<sup>1, 2</sup>, LIU Zhibin<sup>1, 2</sup>, YUE Yuezhen<sup>1, 2</sup>, HAO Jutao<sup>1, 2</sup>

(1. State Key Laboratory of Simulation and Regulation of Water Cycle in River Basin, Beijing 100038, China;

2. China Institute of Water Resources and Hydropower Research, Beijing 100038, China)

**Abstract:** Based on the existing technology of pre-stressed concrete pressure tunnel lining, a new technology of pre-stressed concrete lining technology with ring flat jack is put forward. The key equipment to implement this idea is a ring shape flat jack, which is made of thin steel as hollow circular pressure bag, and which can impose uniform compressive stress of tunnel concrete lining layer through radial displacement. From the simulation experiment, it is proved that circular flat jack made by thin steel plate can apply pre-stress on the lining structure through grouting or injection, and the circumferential pre-compression stress of the lining structure is linear with the injection pressure, which is consistent with the theoretical results.

**Key words:** pressure tunnel; pre-stressed concrete lining; simulation experiment; flat jack