



Research on Tunnel Water Inrush: Mechanisms, Prediction and Mitigation

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Message from the Guest Editors

In recent years, the phenomenon of tunnel water inrush has become a critical issue in geotechnical engineering and hydrogeology. The study of tunnel water inrush and the implementation of effective prediction and prevention measures are imperative and have garnered substantial attention both domestically and internationally. However, the mechanisms of tunnel water inrush and stability analyses require further investigation through diverse methodologies, research subjects (such as the interaction of geological formations with water), and comprehensive data.

- The interaction of geotechnical bodies with water, changes in mechanical properties, and prediction of tunnel water inrush using applied geophysics techniques such as the electrical method and induced polarization;
- The evaluation of tunnel stability under hydrogeological conditions and the prediction of water inrush events during tunnel boring machine (TBM) operations, including the prevention of TBM card machine scenarios;
- The prediction of tunnel water inrush volume;
- The impact assessment of water inrush hazards under varying geological conditions and measures for disaster prevention and mitigation.





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