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Title	インテリジェント学習に基づく屏第2水力発電所トンネルのロックバースト災害の予測
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[2P0136-36-01]インテリジェント学習に基づく屏第2水力発電所トンネル のロックバースト災害の予測 (発表者：修士課程)

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Rockburst is a major challenge in underground engineering and mining engineering. The study on rockburst mechanism, prediction, and control methods is still a frontier topic to be investigated. For example, accurate rockburst prediction to ensure the safety of underground excavation by traditional methods is difficult due to the uncertainty of influencing factors and the limitations. Based on the theory of statistical learning and intelligent optimization, this paper uses the Linear multiple Regression algorithm, the k-Nearest Neighbor algorithm, the Particle Swarm Optimization, and the Bayes algorithm to predict rockburst intensity. The elastic energy index which is the ratio of the elastic energy to the energy of the internal structural damage, brittleness, and the ratios of the maximum shear and the maximum principal stresses to the uniaxial compressive strength were selected as the indicators of rockburst prediction. Rockbursts were divided into four grades: no, small, medium and severe. Forty-five rockburst cases were used to train the prediction algorithms. The accuracy of the algorithms was compared and the advantages and disadvantages of each algorithm were evaluated. They were also applied to the rockbursts at the auxiliary tunnel of Jinping II Hydropower Station. The results showed that the Linear multiple Regression algorithm was not accurate. On the other hand, the k-Nearest Neighbor, Particle Swarm Optimization, and Bayes algorithms were very accurate. They can quickly and intuitively judge the potential intensity of rockbursts in the surrounding rock mass. The rockburst prediction methods are much more accurate than traditional ones and have strong engineering practicability and application prospects.