# Article information:

Modeling study of cumulative damage effects and safety criterion of surrounding rock under multiple full-face blasting of a large cross-section tunnel - ScienceDirect  
<https://www.sciencedirect.com/science/article/pii/S1365160921002665>

# Article summary:

1. A blast-induced damage model integrating the tensile damage model with the Drucker-Prager yield condition is established to study the cumulative damage effects of surrounding rock under multiple full-face blasting during tunnel blasting excavation.

2. The maximum damage depth and peak particle velocity occur in the middle of the tunnel invert, and a critical PPV associated with rock damage is proposed for tunnel blasting excavation.

3. Numerical simulation provides a promising approach to understand the blast damage in rock, and extensive research in numerical modeling of blast-induced damage in tunnels has taken place in recent years.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

The article titled "Modeling study of cumulative damage effects and safety criterion of surrounding rock under multiple full-face blasting of a large cross-section tunnel" provides an in-depth analysis of the blast-induced damage to surrounding rocks during the excavation of a large cross-section tunnel. The article presents a blast-induced damage model that integrates the tensile damage model with the Drucker-Prager yield condition, which is used to simulate the damage process of surrounding rock under multiple full-face blasting.

The article provides valuable insights into the potential risks associated with tunnel excavation using drilling and blasting techniques. However, there are some biases and limitations in the article that need to be considered. Firstly, the article focuses solely on the blast-induced damage caused by drilling and blasting techniques, without considering alternative methods for tunnel excavation. This one-sided reporting may lead readers to believe that drilling and blasting are the only viable options for tunnel excavation.

Secondly, while the article provides extensive numerical simulations and field test data to support its claims, it does not explore counterarguments or alternative explanations for its findings. This lack of exploration may limit readers' understanding of the complexity of blast-induced damage in rocks.

Thirdly, while the article notes potential risks associated with drilling and blasting techniques, it does not provide recommendations or solutions for mitigating these risks. This omission may limit readers' ability to take action to reduce potential harm.

Finally, there is some promotional content in the article related to LS-DYNA computer code. While this software may be useful for simulating blast-induced damage in rocks, it is important to note that other software programs may also be effective.

In conclusion, while this article provides valuable insights into blast-induced damage during tunnel excavation using drilling and blasting techniques, readers should consider its biases and limitations when interpreting its findings.

# Topics for further research:

* Alternative methods for tunnel excavation
* Limitations of drilling and blasting techniques
* Mitigating risks associated with tunnel excavation
* Counterarguments to blast-induced damage model
* Comparison of LS-DYNA with other software programs for simulating blast-induced damage
* Environmental impact of tunnel excavation techniques

# Report location:

<https://www.fullpicture.app/item/2e953da2e70ac337d4a11fe6b7ecb477>