

## An orthotropic model for concrete structure subjected to impact loading

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### ABSTRACT

This study aimed to develop an orthotropic material model to accurately predict the behavior of concrete structures subjected to impact loading. A unified formula is proposed to characterize both the effect of strain rate and the effect of stress ratio on the ultimate strength of concrete in triaxial stress states. In order to verify the accuracy of the proposed model in predicting structural behavior under impact loading, numerical analyses were performed for a perforation test of a concrete slab subjected to a projectile. The results show that the proposed orthotropic model can effectively be used in the impact analyses of concrete structures.

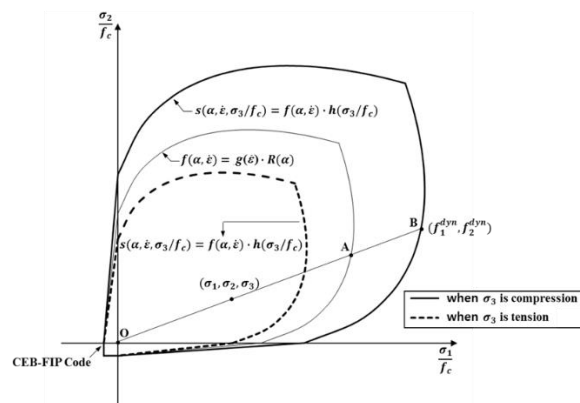


Fig. 1 Triaxial strength envelope of strain rate dependent orthotropic model

### REFERENCES

Yan, D. and Lin, G. (2007), "Dynamic behavior of concrete in biaxial compression", *Magazine of Concrete Research*, **59**(1), 42-52.

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