



## **Nonlinear deformation wave in rock mass surrounding deep level tunnel and its modeling**

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In this paper we studied nonlinear deformation wave by using continuous phase transition theory. Relative shear strain is taken as order parameter. By using Landau-Ginzburg's expansion of free energy we determined the potential energy of the medium. Hamiltonian variational principle is used to obtain the motion equation of the medium. Several types of deformation waves can be modeled by the obtained motion equation. The results show that the present model is effective in modeling nonlinear deformation waves.