## Numerical Analysis of Effect of Crack Location on the Crack Breathing Behavior

Authors : H. M. Mobarak, Helen Wu, Keqin Xiao

**Abstract :** In this work, a three-dimensional finite element model was developed to investigate the crack breathing behavior at different crack locations considering the effect of unbalance force. A two-disk rotor with a crack is simulated using ABAQUS. The duration of each crack status (open, closed and partially open/closed) during a full shaft rotation was examined to analyse the crack breathing behavior. Unbalanced shaft crack breathing behavior was found to be different at different crack locations. The breathing behavior of crack along the shaft length is divided into different regions depending on the unbalance force and crack location. The simulated results in this work can be further utilised to obtain the time-varying stiffness matrix of the cracked shaft element under the influence of unbalance force.

Keywords : crack breathing, crack location, slant crack, unbalance force, rotating shaft

**Conference Title :** ICFMPCA 2017 : International Conference on Fracture Mechanics, Polymers, Composites and Adhesives **Conference Location :** Sydney, Australia

Conference Dates : December 04-05, 2017