

# **AN EFFECTIVE ENVELOPE ANALYSIS TECHNIQUE FOR ESTIMATION OF FAULT DEGREE IN BEARINGS**

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## **Abstract**

In rotary machinery, the bearing faults are the most frequent in among electrical and mechanical failures. This paper proposes an efficient method for estimation of the fault degree in bearings. The obtained acoustic emission (AE) signals for each bearing fault are first processed by the envelope analysis technique to detect the frequency periodic impulses showing the abnormal symptoms in bearings. A Gaussian distribution model (GDM)-based window method is then performed to only capture the characteristic defect frequencies from the obtained envelope power spectrum signals for evaluation. As a result, a ratio of fault frequency components to residual frequency components (RFR) is calculated for accurate estimation of the fault degree in bearings.

Key words: Bearing fault, acoustic emission, envelope analysis, Gaussian distribution model.