

# **Seismic Image Analysis and Pattern Recognition to Identify Fault Diagnosis for Roller Bearing**

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## **Abstract**

Seismic discontinuity. However to map subtle faults to identify the fracture corridor it is observed that attribute based on image analysis using convolve algorithm can brought out significant improvement compare to geometry based attribute like minimum curvature. After analyzing the various attribute like similarity variance and minimum curvature in this paper Seismic imaging beneath basalt flows continues to provide challenge Lower frequency energy in the source wavelet is more likely to penetrate through the basalt than higher frequencies as it is less attenuated by intrinsic absorption, and less scattered by the heterogeneity of the basalt reflectors providing improved images beneath basalt flows is therefore to generate, retain and enhance as much low frequency energy as possible. The first technique involves boosting low frequency signal at the beginning of the processing sequence. The second technique involves attenuating coherent and incoherent noise in all of the available 'timeoffset' domains. We present examples of the data after application of these techniques and demonstrate clear improvements over the original processing Bearing failure are one of the major causes of breakdown in rotating machinery. In complex machines, at the incipient stages of bearing damage, the failure signs are weak compared to other sources of excitations (e.g. gears, shafts, rotors, etc.). The task of emphasizing the failure signs is complicated by the fact that changes in operating conditions influence vibrations sources and change the frequency and amplitude characteristics of the signal, making it non-stationary. As a result, a joint time-frequency representation is required. Previous vibration based diagnostic techniques focused on either the time domain or the frequency domain. The proposed method suggests a different solution that applies image processing techniques to spectrograms of the vibration signals in the orders-RPM domain. In the first stage, spectrograms of healthy machines are used to create a baseline. The spectrograms can be obtained using various time-frequency representations (Wigner-Ville, wavelets, STFT, etc). In the next stage, the distance spectrogram between the inspected recording and the baseline is computed. In the third stage, the distance spectrogram is analyzed using ridge tracking and other image processing algorithms. In the fourth stage, the relations between the detected ridges are compared to the characteristic patterns of the bearing failure modes and the matching ridges are selected. The different stages of analysis: baselines, distance spectrogram, ridges detection and selection, are illustrated with real data of damaged Use of seismic attribute in seismic data interpretation is a common task now a days. Primarily it is used as aid to guide the correlation of faults. It is also optimizes the mapping of subtle faults which can not be mapped directly on vertical seismic section.

## **Keywords**

Seismic image analysis, Fault analysis, Time frequency domain.