Experiment design for acoustic emission analysis of wear in rolling bearings

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Acoustic emission (AE) sensing is widely used as a non-destructive testing method on materials, structures and components. The high frequency elastic waves originate from localized stress release events in the material and can be measured with specialized AE sensor systems. Depending on the material and area of application, the signal can be used to inform monitoring of structural health, wear, friction, temperature gradients and more. With the rapid development of machine learning algorithms over the previous decade, there is now a great interest to establish the true extent of the information that can be extracted from application specific AE signals. The following poster proposes a design for a mechanical rig intended to damage rolling bearings while monitoring the AE signatures. The goal of the experiment is to confirm the methodology of current algorithms, provide data for development of new processing techniques, and to contribute to the general understanding of the involved wear mechanisms and their evolution.

Keywords: Acoustic emission, rolling bearings, wear, non-destructive testing, health monitoring.

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