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# GEARBOX DAMAGE IDENTIFICATION AND QUANTIFICATION USING INNOVATIVE TECHNIQUES

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## Résumé

Amongst the many new tools used for vibration based mechanical fault diagnosis in rotating machineries, Stochastic Resonance (SR) has been shown to be able to identify as well as quantify gearbox damage via numerical simulations. To validate the numerical simulation results, SR is applied in the present study to data from an experimental gearbox that is representative of an industrial gearbox. Both spur and helical gears are used in the gearbox setup. While the results of the direct application of SR to the experimental data do not exactly corroborate the numerical results, applying SR to the experimental data in pre-processed form is shown to be quite effective. In addition, it is demonstrated that traditional statistical techniques used for gearbox diagnosis can be used as a reference to check how well SR performs.

**Mots-Clés:** Stochastic Resonance, damage identification and quantification, preprocessed signals.

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