



SEMINAR

APPLIED MATHEMATICS AND MECHANICS

FS940

31 August 2018

A DCAMM seminar No. 729 will be presented by

Professor Emeritus Bob Randall
UNSW Sydney
Australia

The title of the lecture is

Diagnostics of variable speed machines

Abstract:

For many years, condition monitoring (CM) of machines based on vibration analysis was limited to machines running at constant speed, and even for machines such as helicopter gearboxes, it was usually possible to run machines at near constant speed for long enough to capture signals for processing. In recent years, one of the most important developments has been the need to perform CM on machines with variable speed, such as wind turbines, and mobile equipment, for example in mining. A lot can be achieved by using “order tracking”, resampling signals at constant intervals of rotation angle (phase), however, this does not make signals periodic, for the following reasons:

- 1) Angular resampling removes frequency modulation (FM) but not amplitude modulation (AM), so synchronous averaging cannot be used to remove shaft speed related components.
- 2) Many signals, e.g. from bearing faults, consist of a series of impulse responses (IRs) with a spacing tied to shaft speed, but fixed (resonance) frequencies, so when speed varies the spacing is different, but the length of the IRs is constant, while if angular sampling is used, the spacing is constant but the IR length variable. Synchronous averaging cannot be used in either case.

DATE:	Friday, 14 September 2018
TIME:	14:15 – 15:00 + questions
PLACE:	Meeting Room: O TEK Ellehammer (Ø28-600-3) located in the TEK building (building 42) SDU, University of Southern Denmark

Danish pastry, coffee and tea will be served 15 minutes before the seminar starts.

All interested persons are invited.

Niels Leergaard Pedersen

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