Aalto University
Rotor Laboratory

Mechatronics Circus

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8.4.2021

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AROTOR
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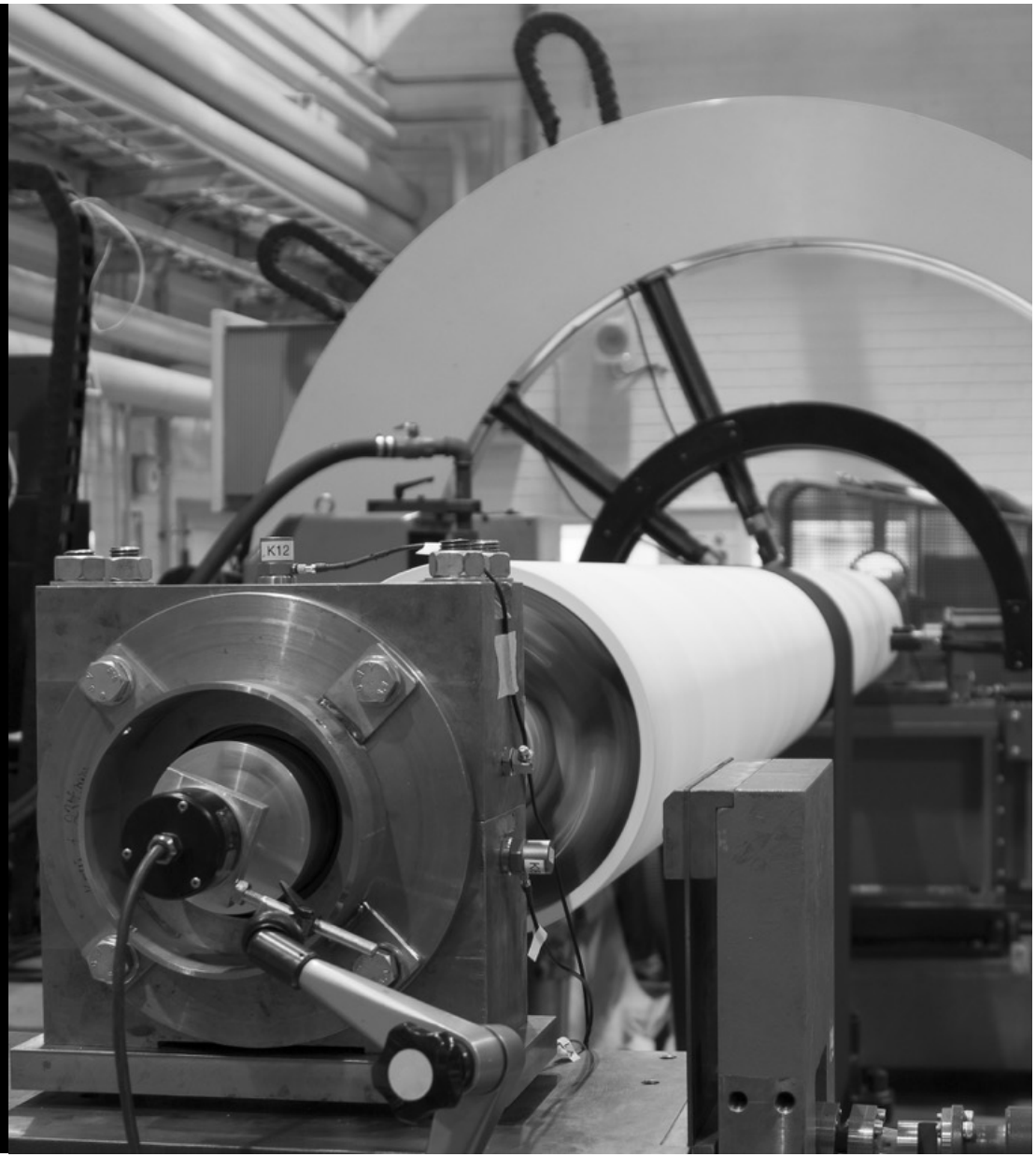

Rotating machinery - Impact

- Nearly all the generated electric energy produced by large rotating machinery
- Rotating machinery responsible for half of the global and 2/3 of the industrial energy consumption
- **Even incremental improvements signify vast energy and material savings**
- **With new ICT methods we can achieve major breakthroughs**
  - **climate change**
  - **sustainable society**




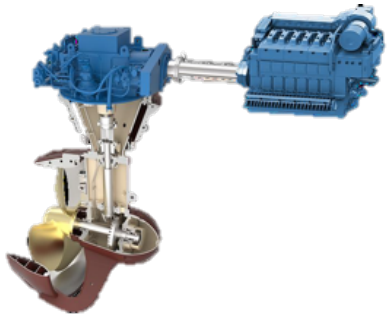

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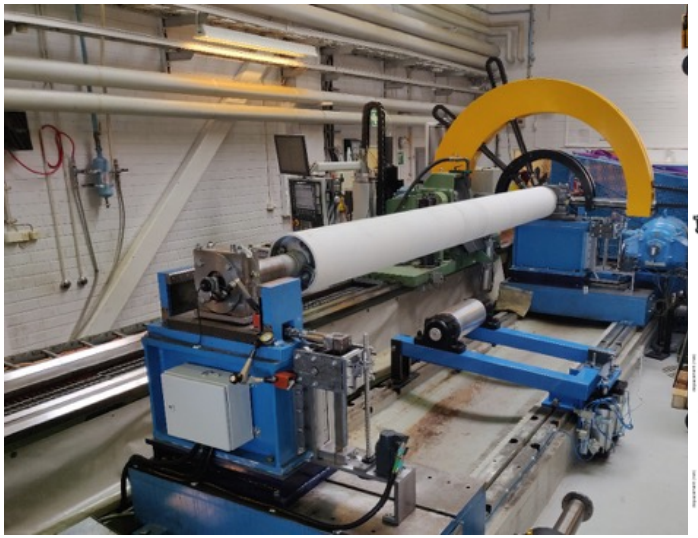
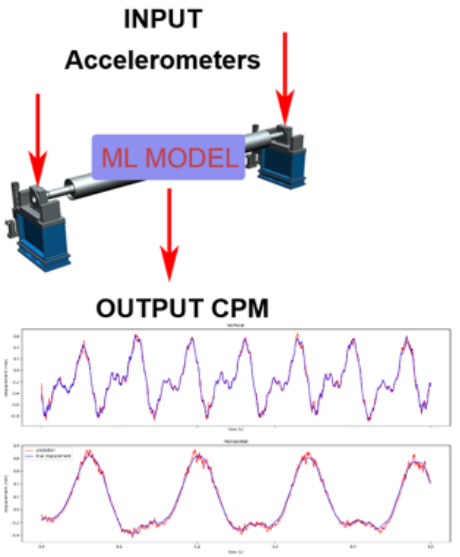
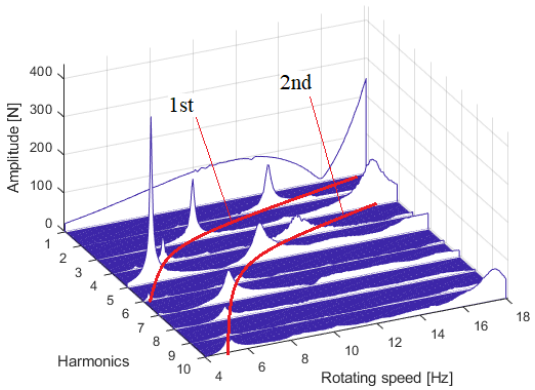
ABB Valmet WÄRTSILÄ KONGSBERG SKF moventas SSAB storaenso

ARotor - Full scale rotor laboratory

- **Rotors up to 25 000 kg**
  - *Manufacturing for operating conditions*
  - Geometry measurement
  - Rotordynamics
  - Bearing excitations
  - Foundation stiffness effect on vibration
  - Harmonic and subcritical vibration
  - DT & AI analyses with full scale ***verification***







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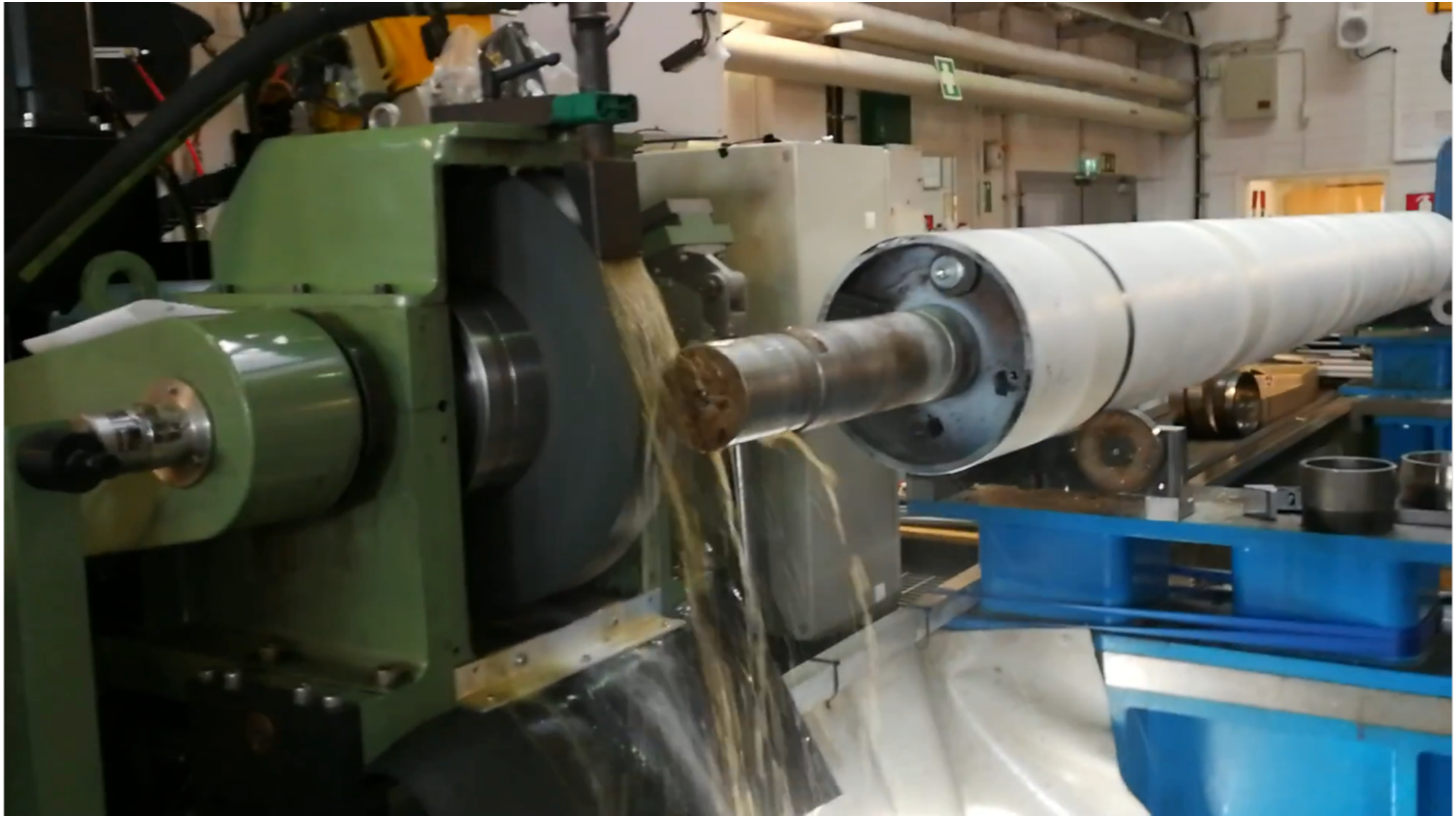
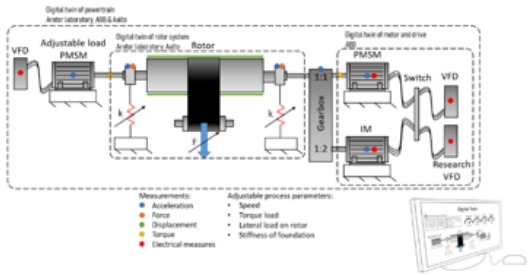


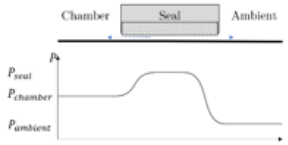
Session overview

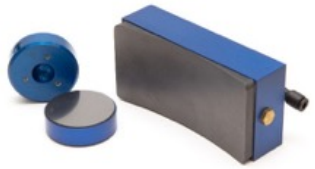
Partners:

Digital Twin of Powertrain: Straighforward modelling of electric powertrains in openTorsion platform
Sampo Laine, Risto Viitala & Urho Hakonen

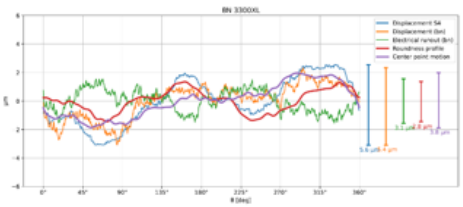


Frictionless motion: Aerostatic bearings
Mikael Miettinen & Valtteri Vainio

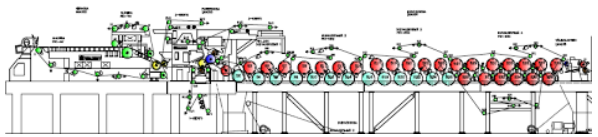




Electrical runout in eddy current based rotor condition monitoring
Tuomas Tiainen



Identifying problematic rotors from cardboard and steel quality data
Sampsa Lehtiniemi



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