

Utveckling av komponenter för ökad dämpning i vattenkraftsrotorer

(Jan.2019 - pågår)

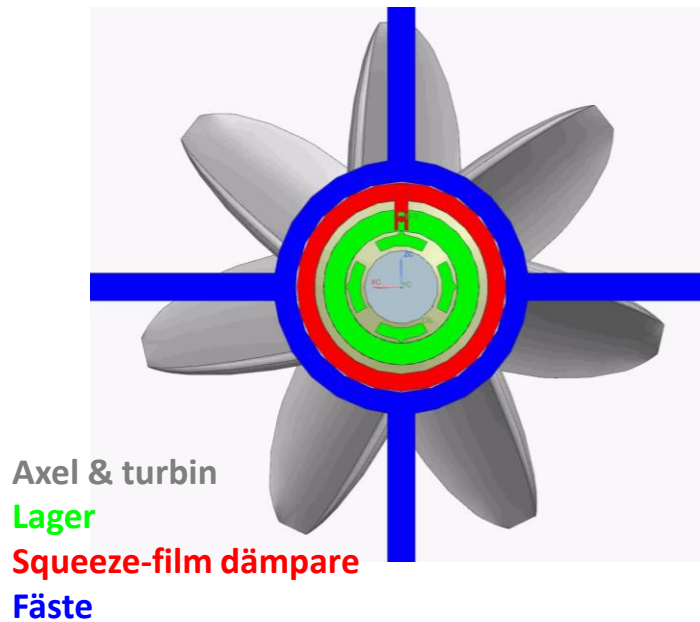
Doktorand: Gudeta Benti

Huvudhandledare: Jan-Olov Aidanpää, Professor, LTU

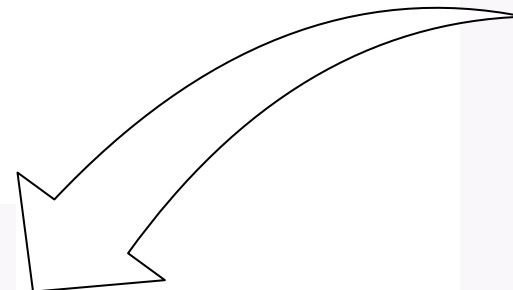
Biträdande handledare: Rolf Gustavsson, PhD, Vattenfall R&D

Syfte

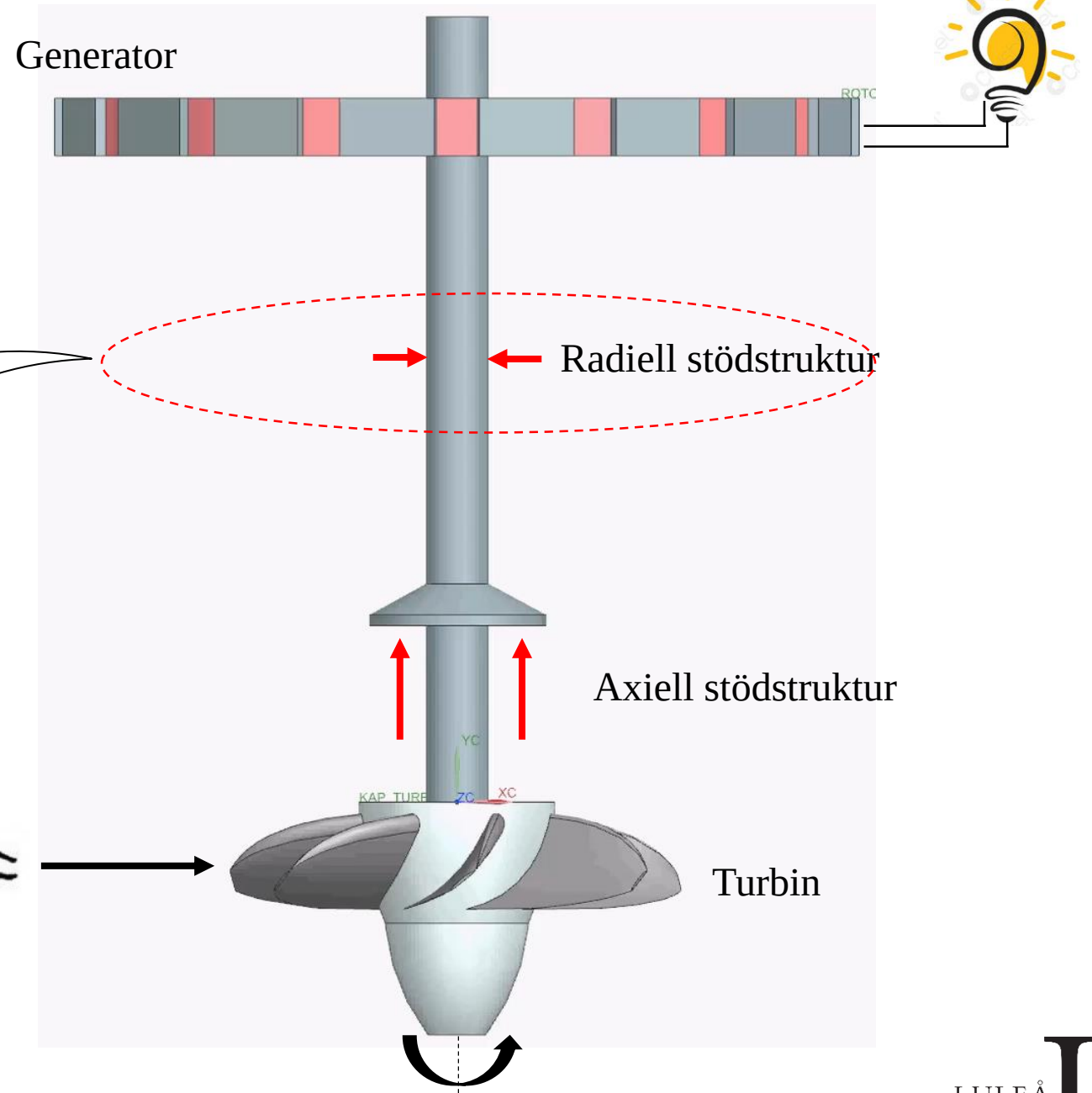
- Öka dämpning i vattenkraftsrotorer



Radiell stödstruktur



Vatten



Projekt

➤ Publicerad

- 4-pad vs 8-pad TPJBs

Paper I: Analytical and experimental study on the dynamic bearing properties of a 4 pad and 8 pad tilting pad journal bearings in a vertical rotor.

Published in Journal of energy resources technology, 2021

➤ Pågår

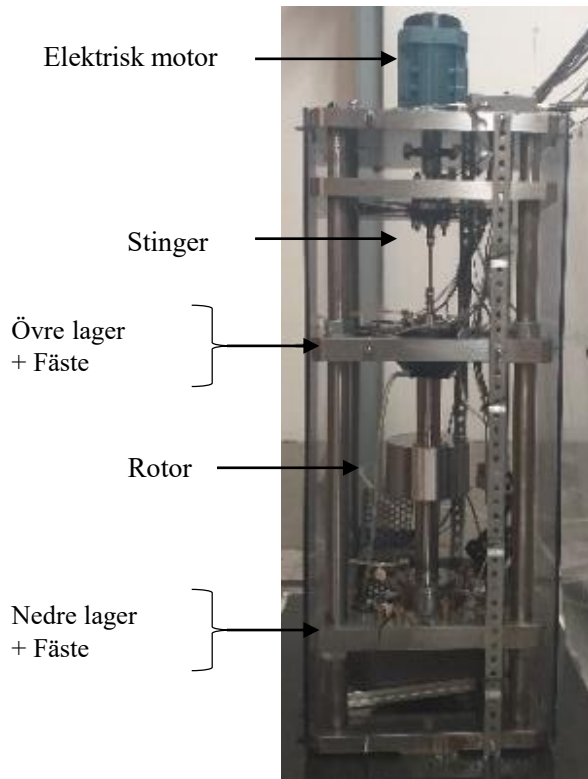
- Lager modell (8-pad & 4-pad tilting-pad journal bearings)
- Startförlopp (8-pad & 4-pad tilting-pad journal bearings)

➤ Planerad

- Squeeze-film dämpare

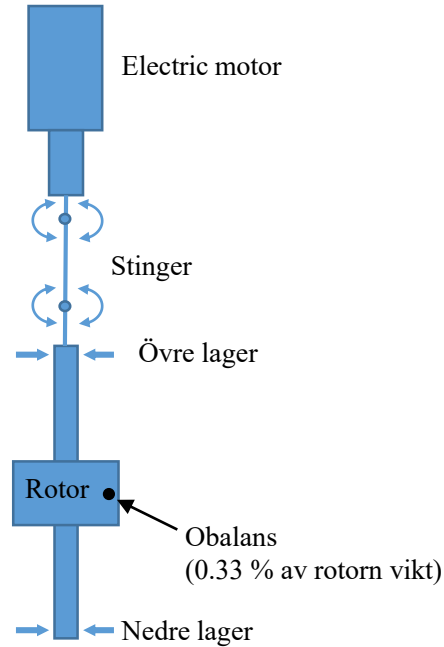
Dynamiska egenskaper av 4-pad Vs 8-pad tilting pad lagren i vertikala rotorerna (Journal of Energy Resource Technology, 2021)

Experiment

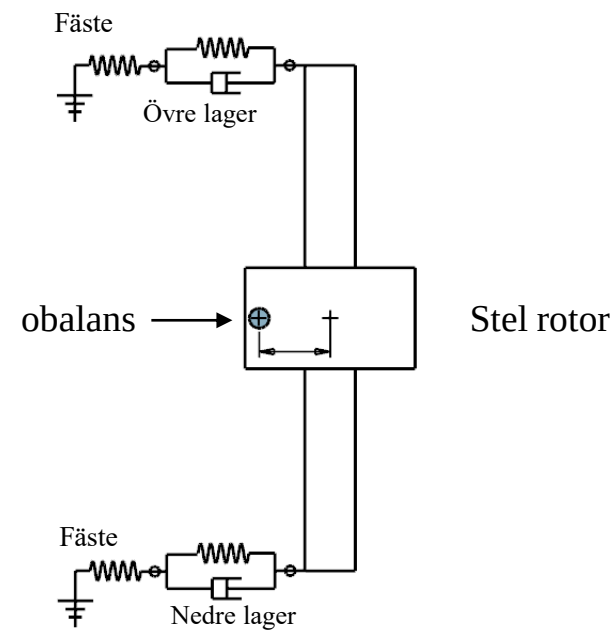


(Vattenfall, Älvkarleby)

Mätning: **kraft** och **förskjutning** kring lagren



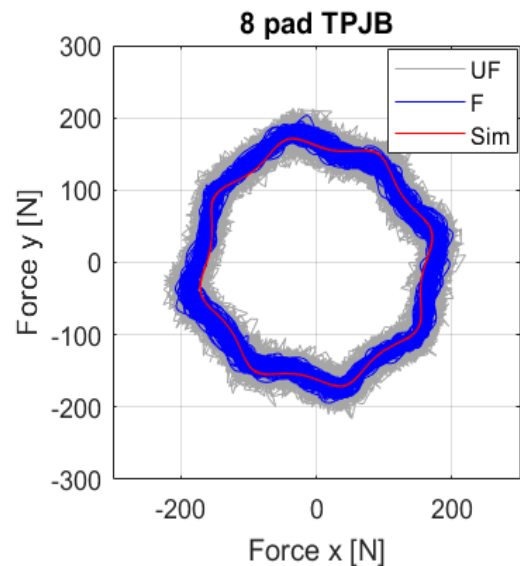
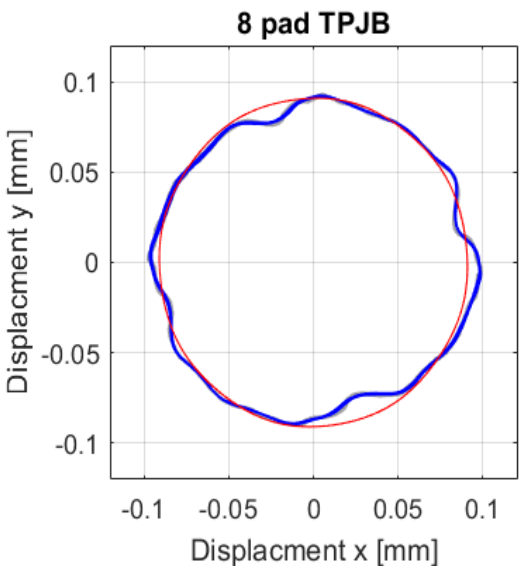
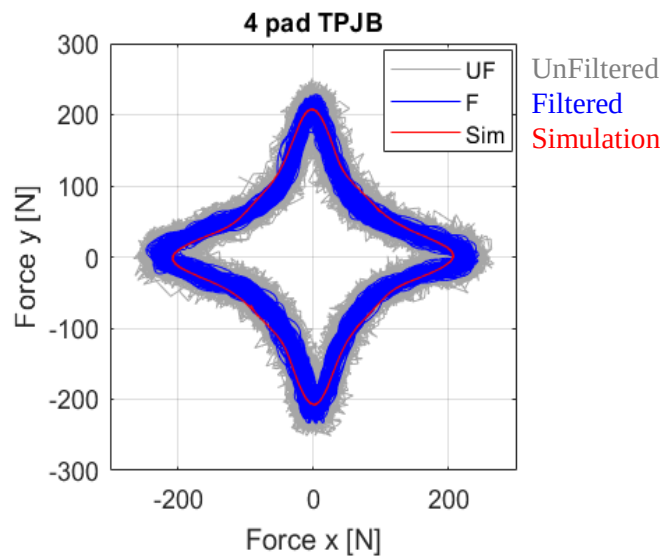
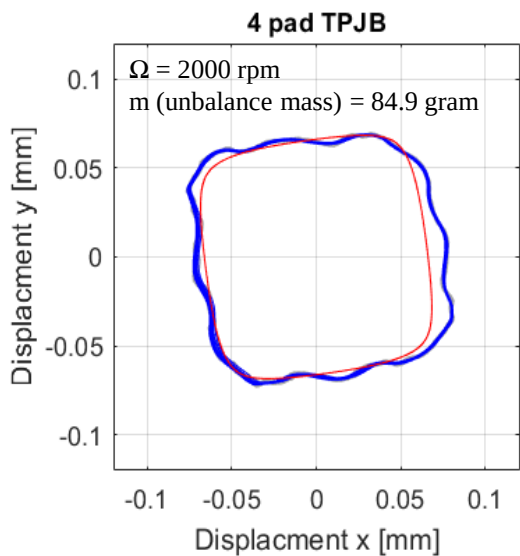
Simulering



$$M\ddot{q} + (\cancel{\Omega G})\dot{q} = f_{unbalance}$$

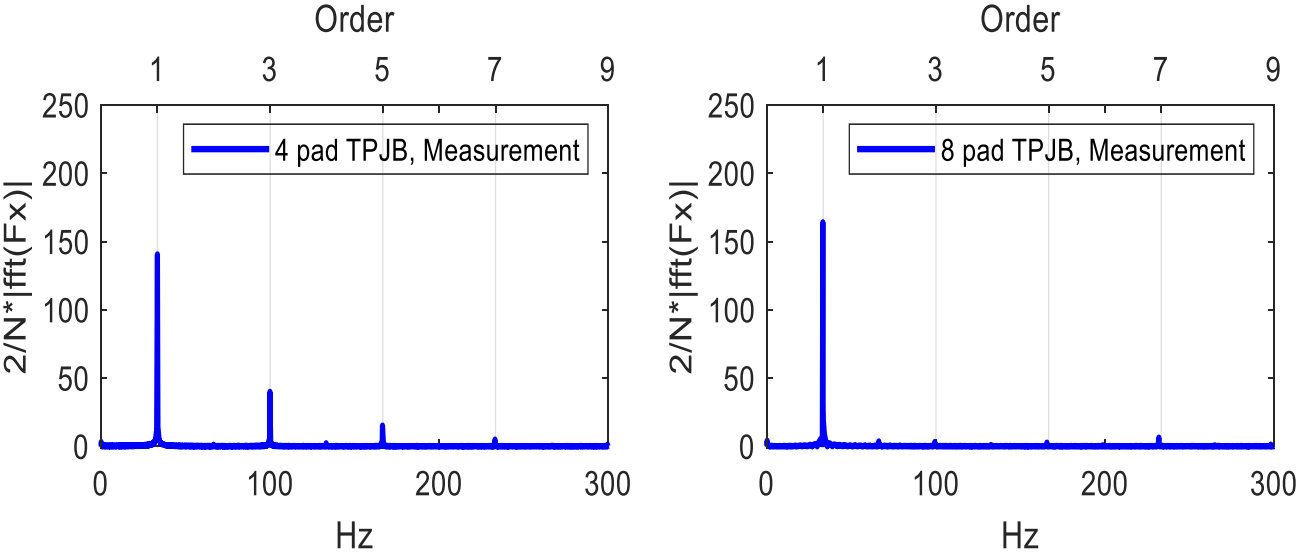
$$M\ddot{q} + (\cancel{\Omega G} + \mathbf{C}_{bearings} + \mathbf{C}_{brackets})\dot{q} + (\mathbf{K}_{bearings} + \mathbf{K}_{brackets})q = f_{unbalance}$$

Resultat

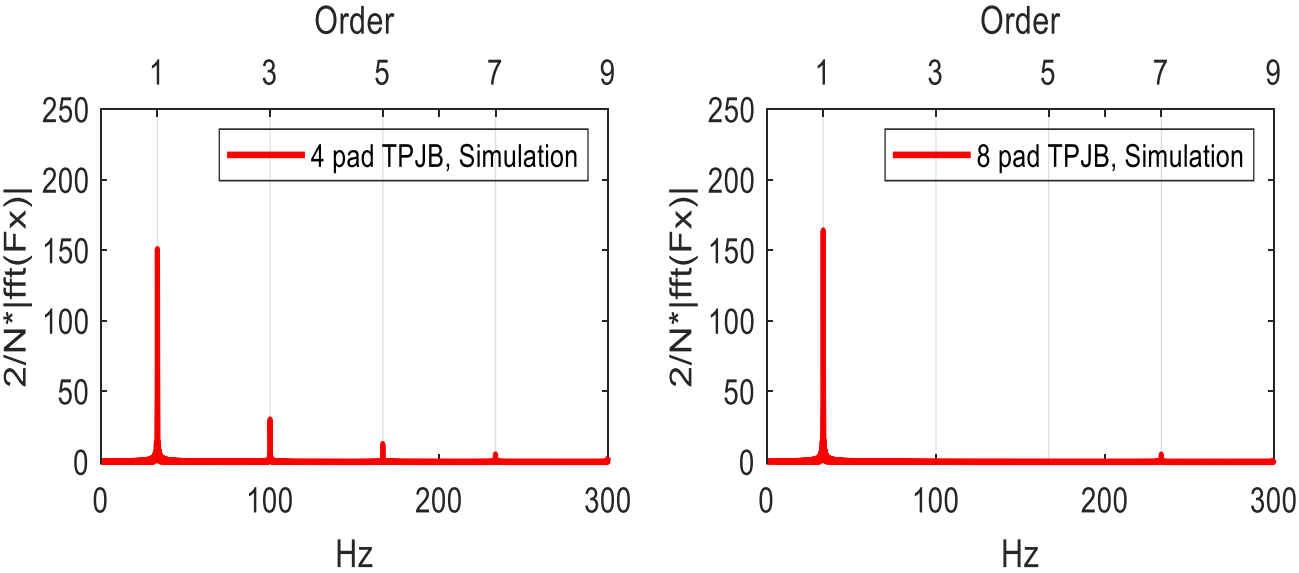


Tidsdomän

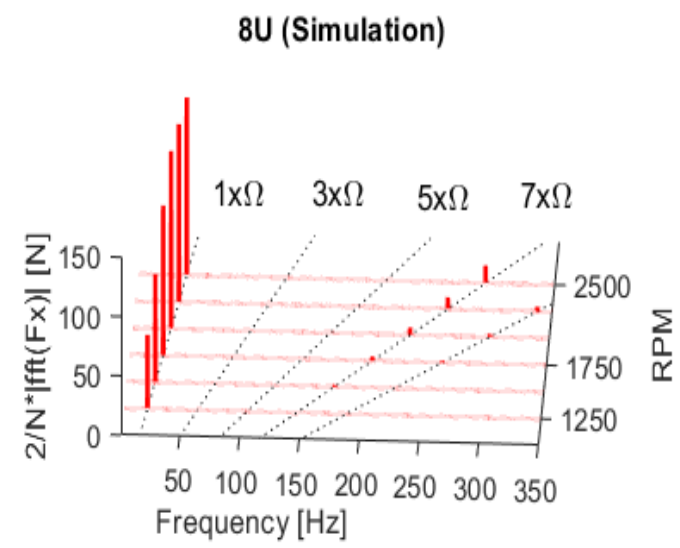
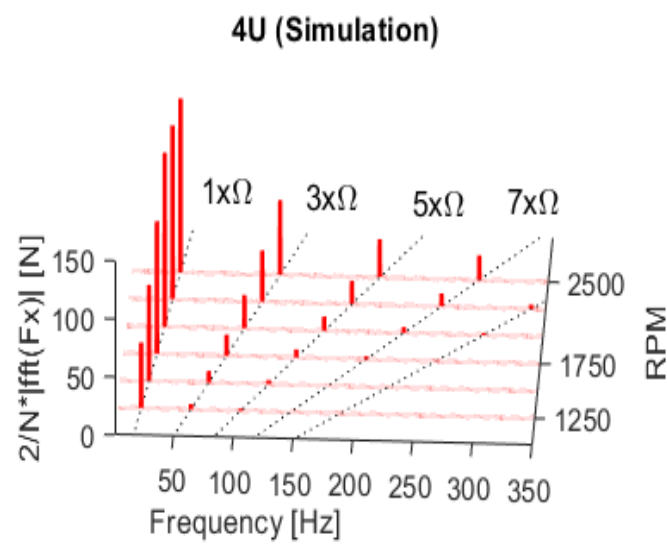
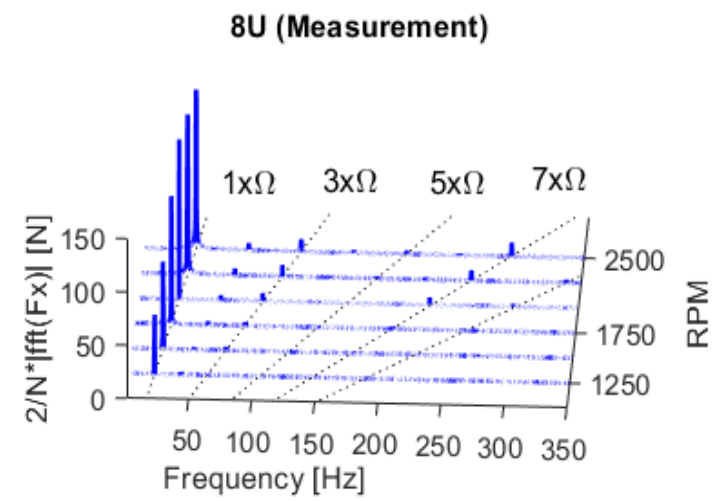
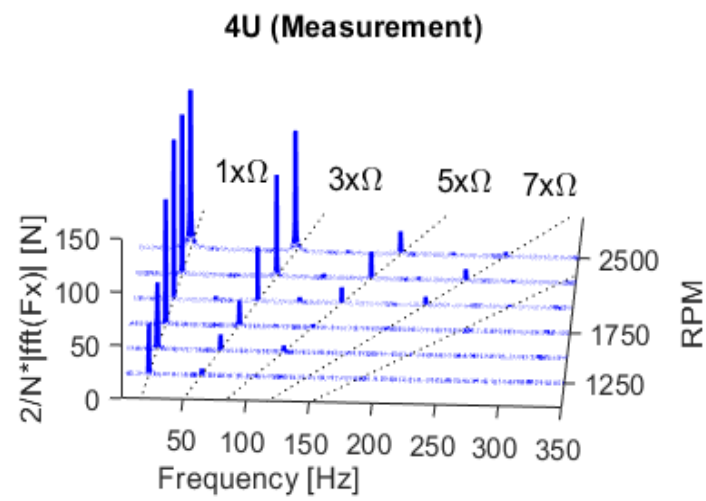
Resultat



Frekvensdomän



Resultat



Tack
&
Frågor?