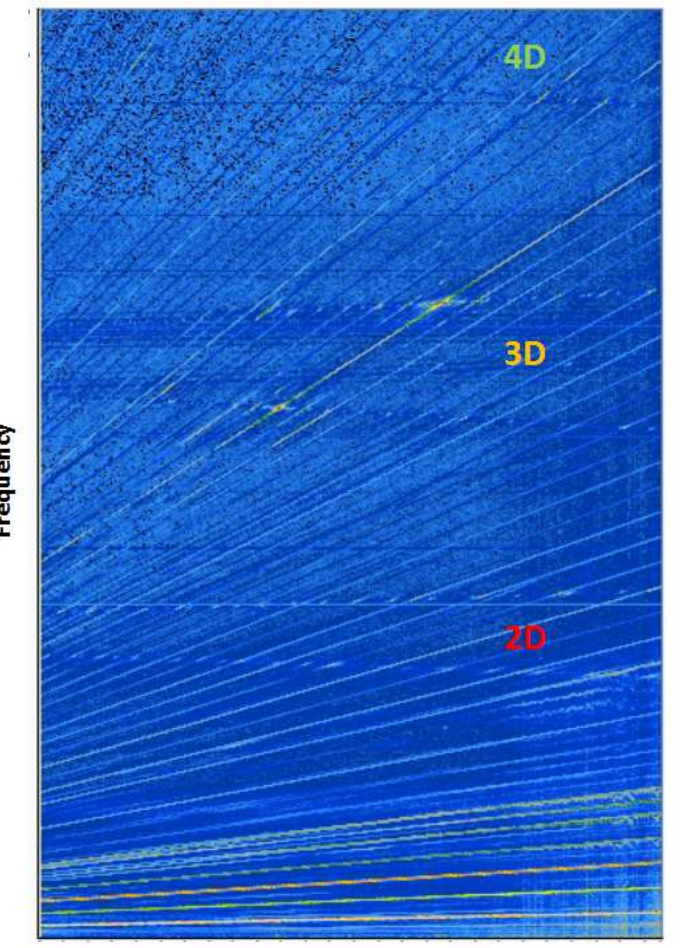
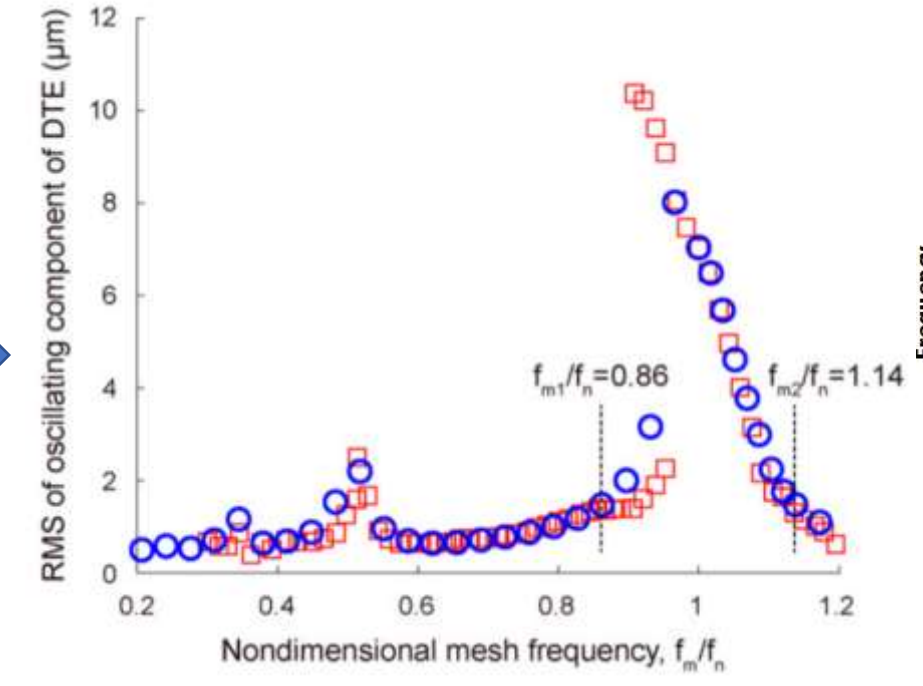
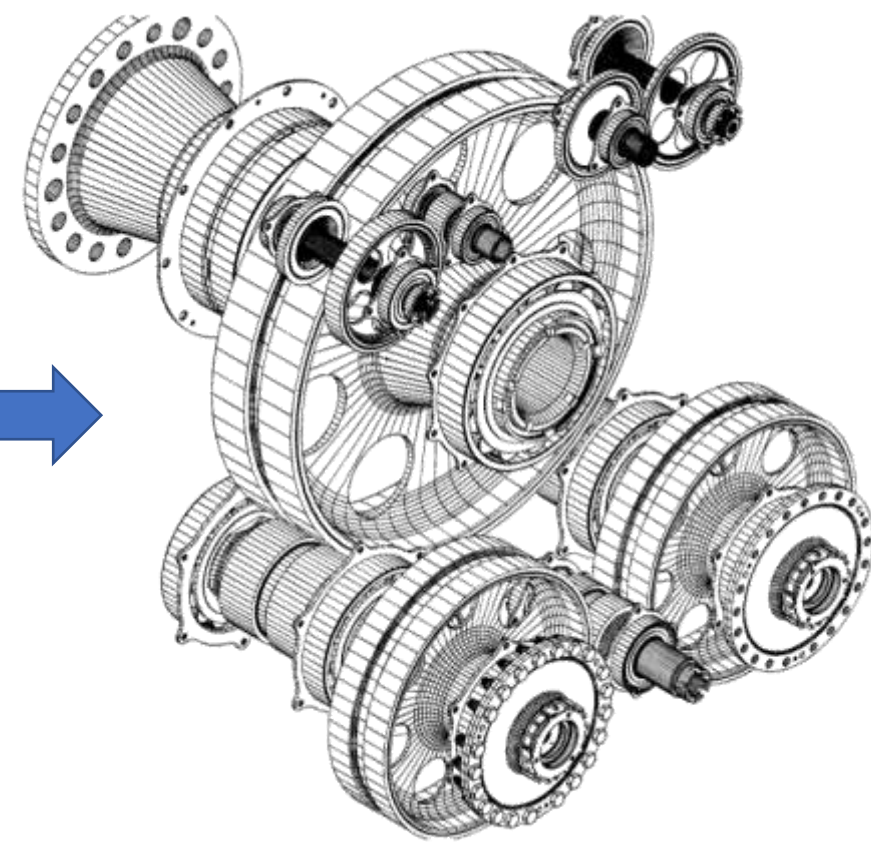
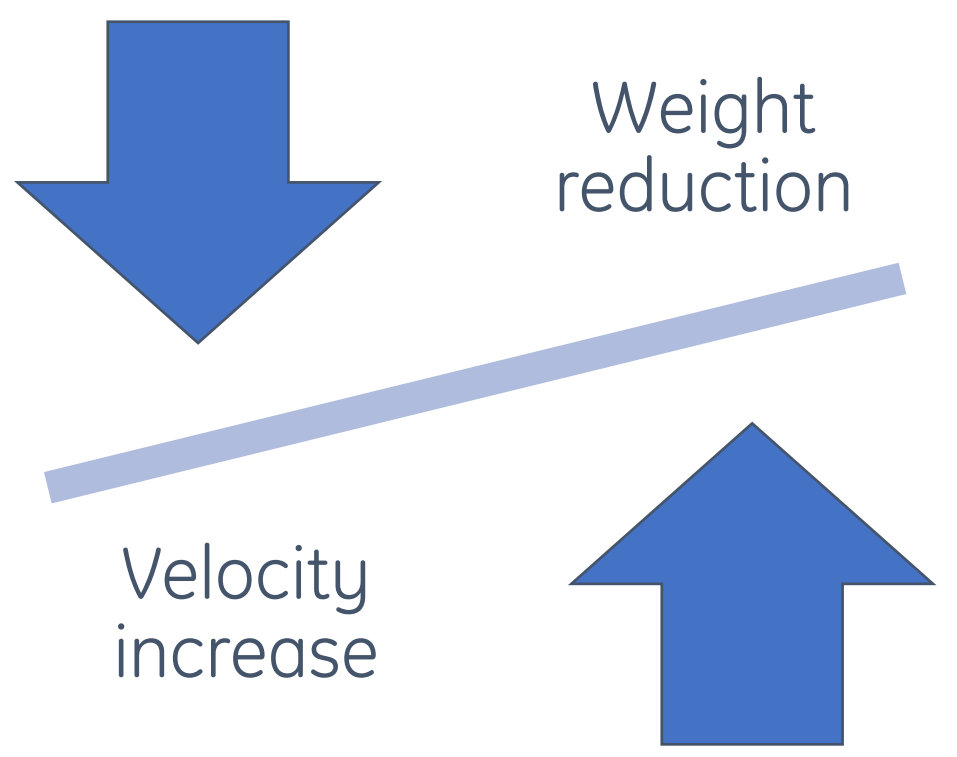


Nonlinear Compliant Gear Statics & Dynamics

Ing. Fabio Bruzzone – Prof. Carlo Rosso

Objective: Increase power density

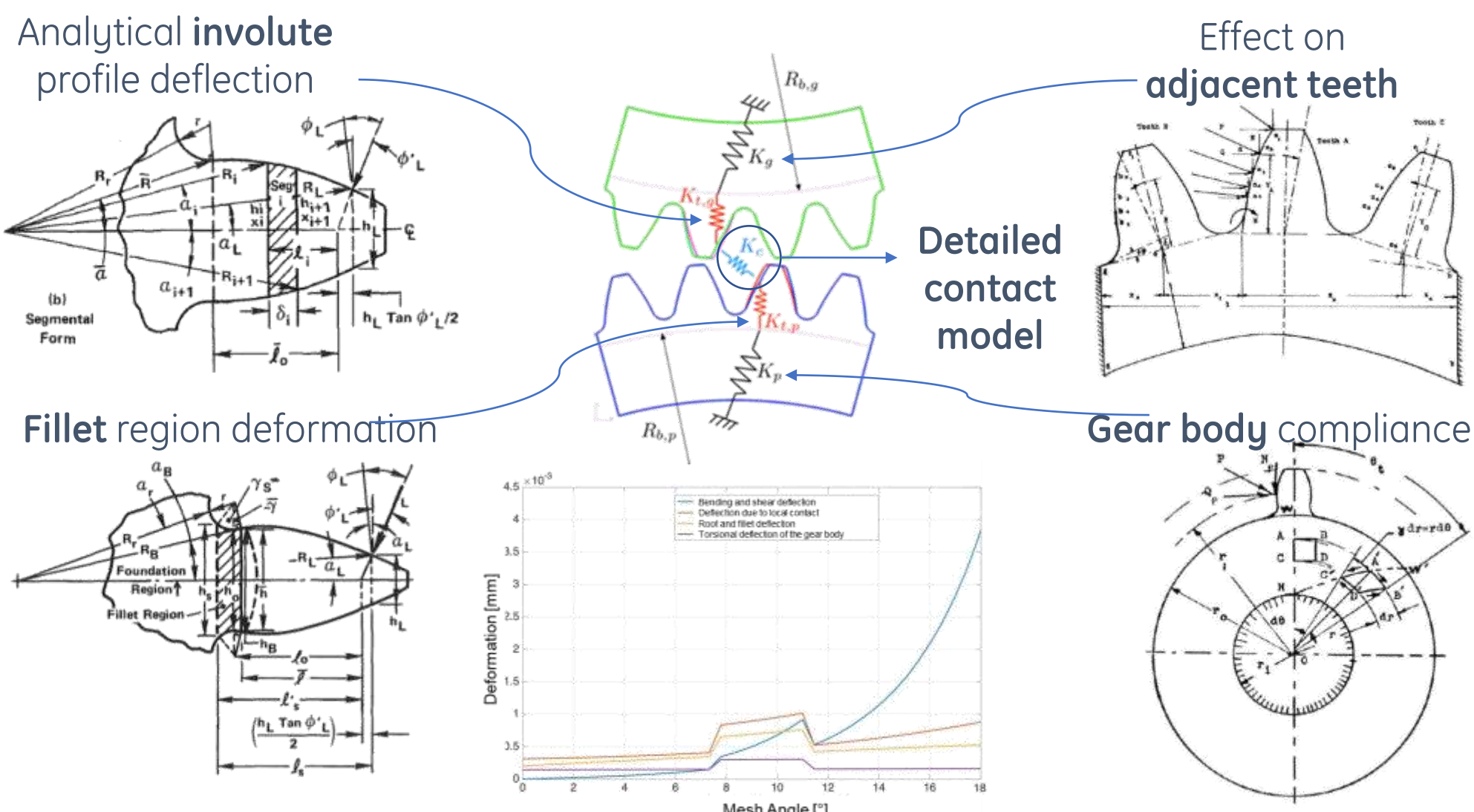


Complex dynamic phenomena

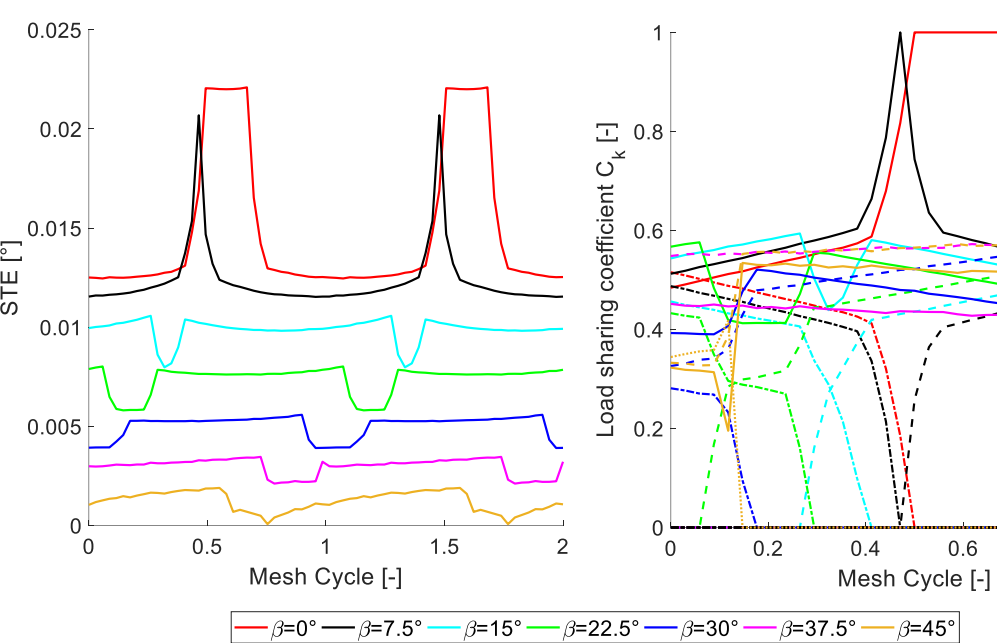
Reliability issues due to dynamic overloads and High Cycle Fatigue, also noise

Detailed models to study the static and dynamic behavior of transmissions are needed

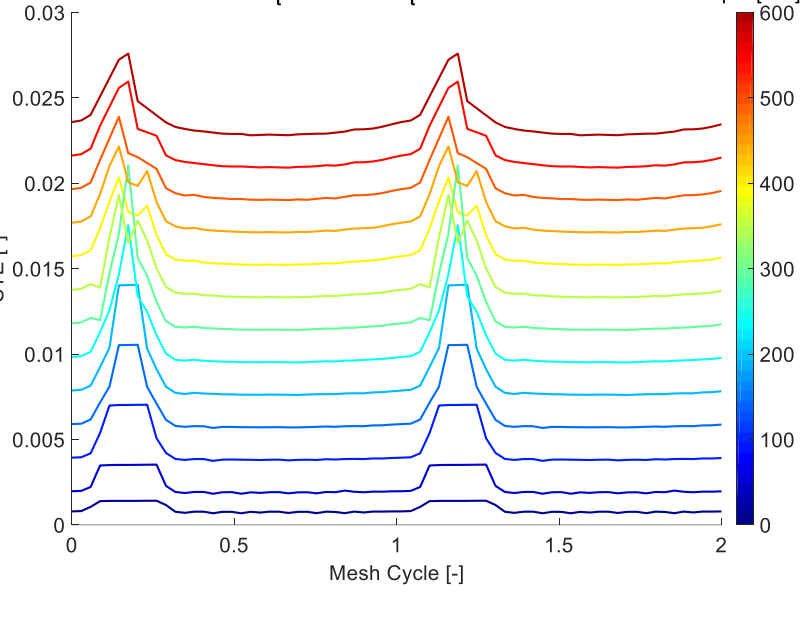
3D nonlinear and non-Hertzian tooth deflection and contact model



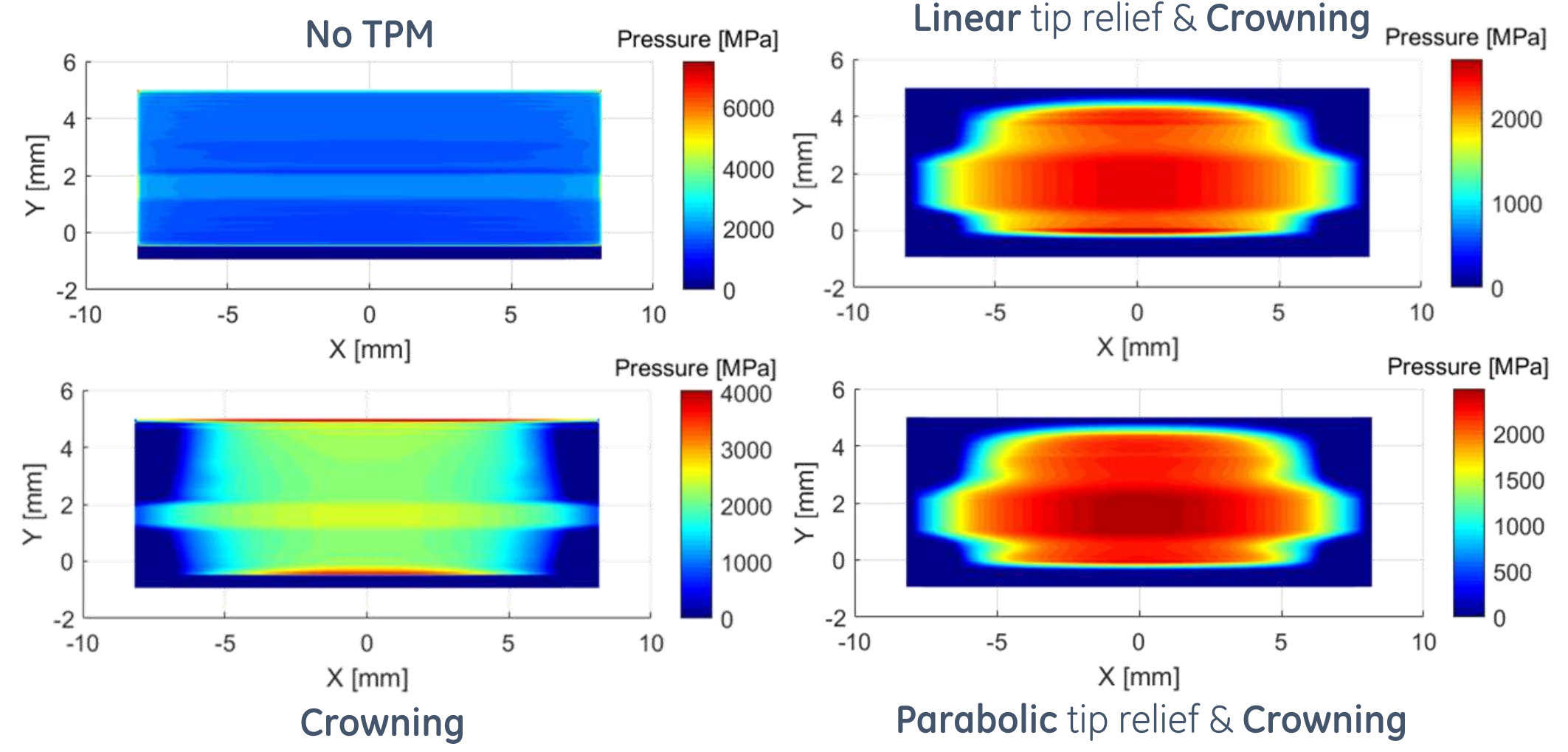
Effect of Helix angle on STE and LSF



Effect of torque on STE $\beta = 22.5^\circ$

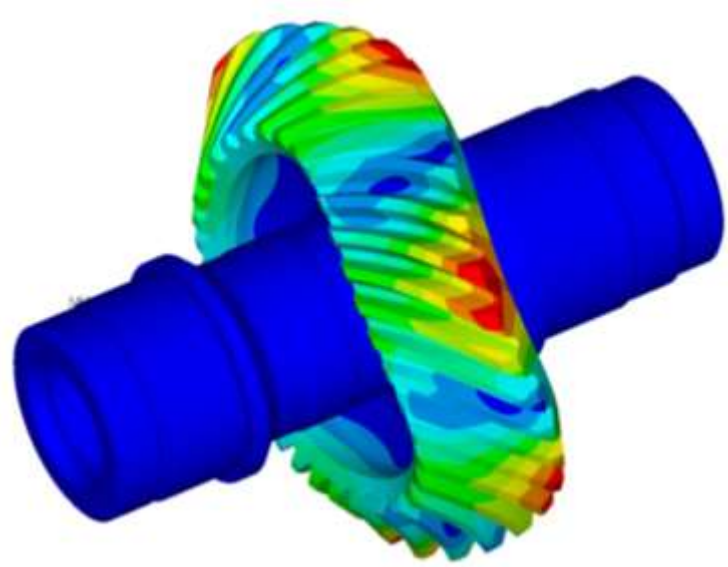


Effect of TPM on the pressure distribution along the flank

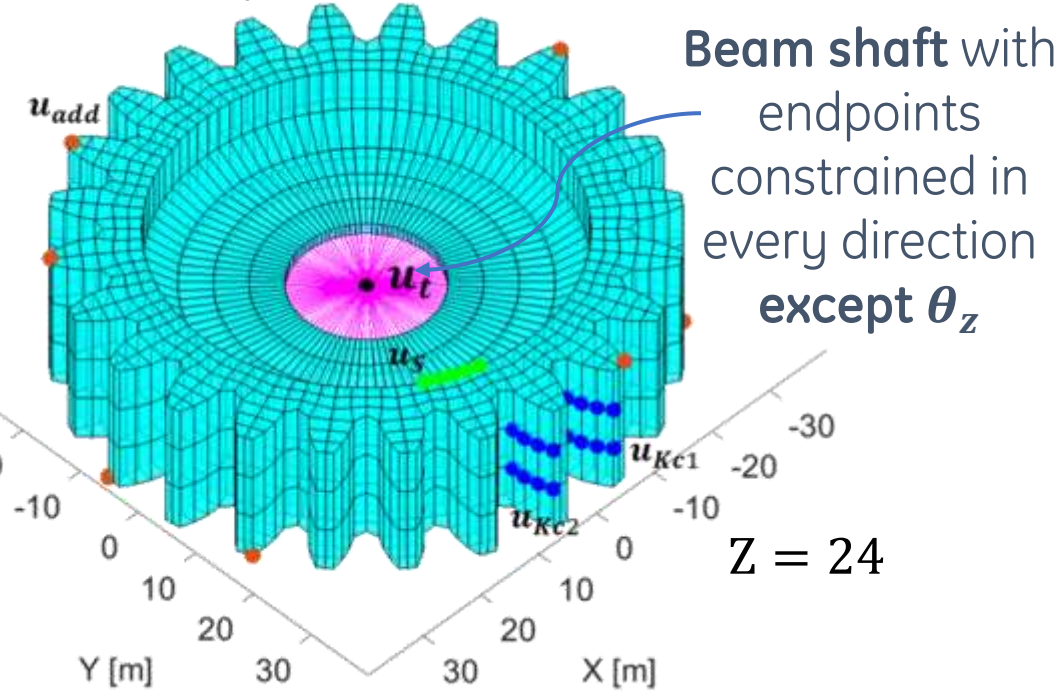


Full flexible nonlinear gear dynamics

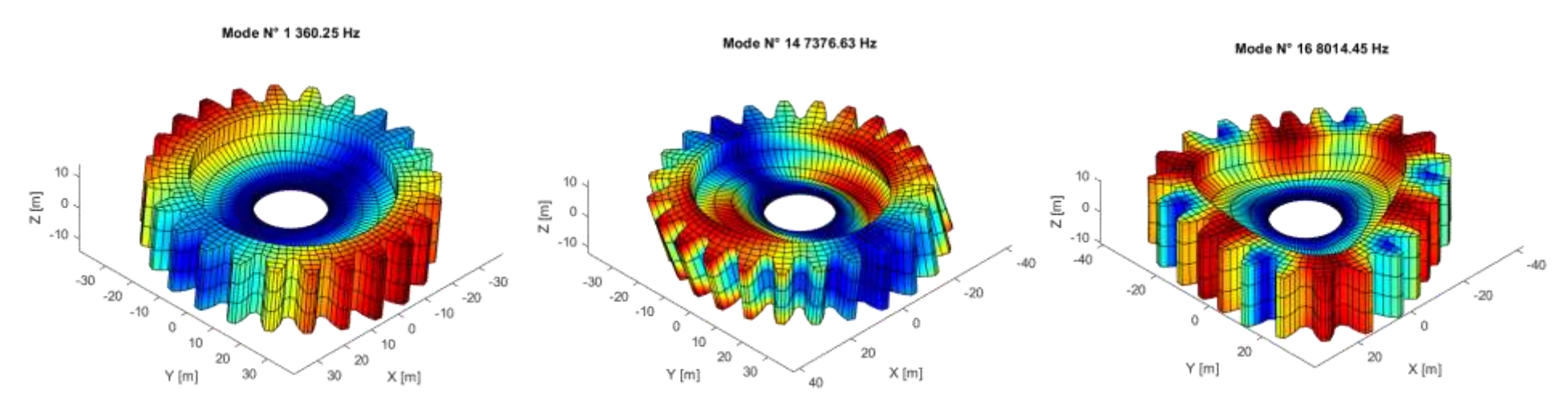
Compliant web model



Forced frequency response

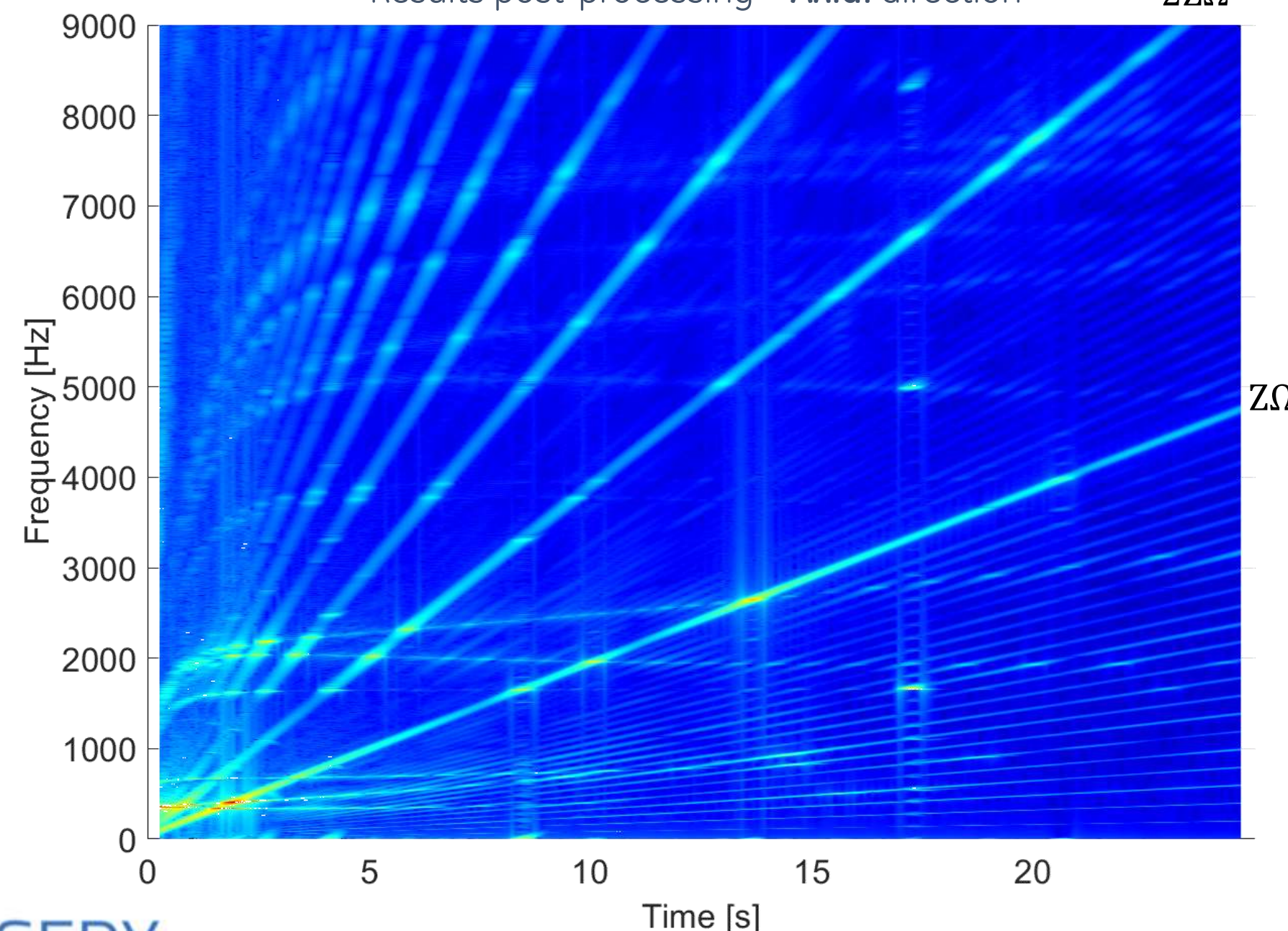
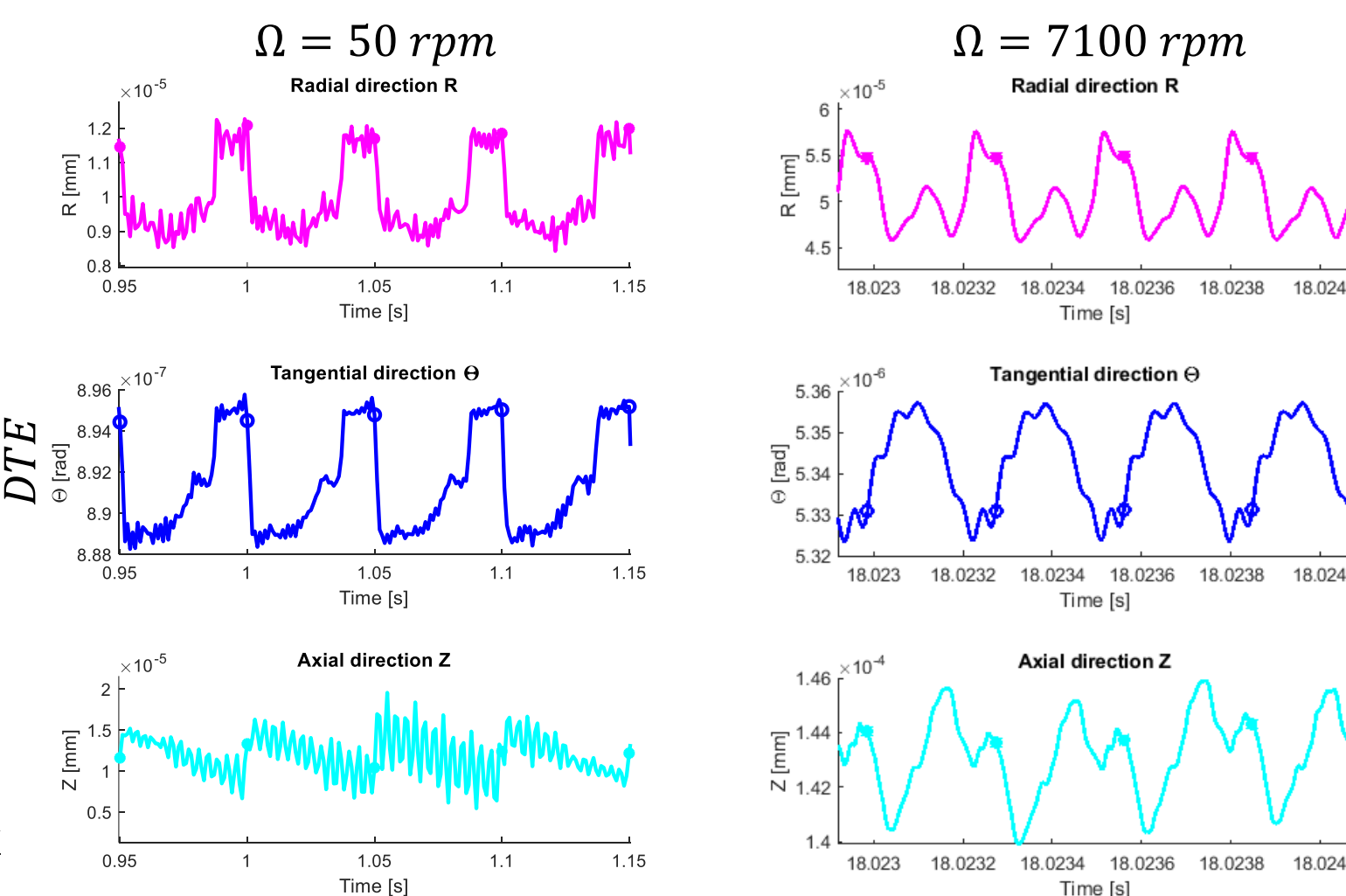
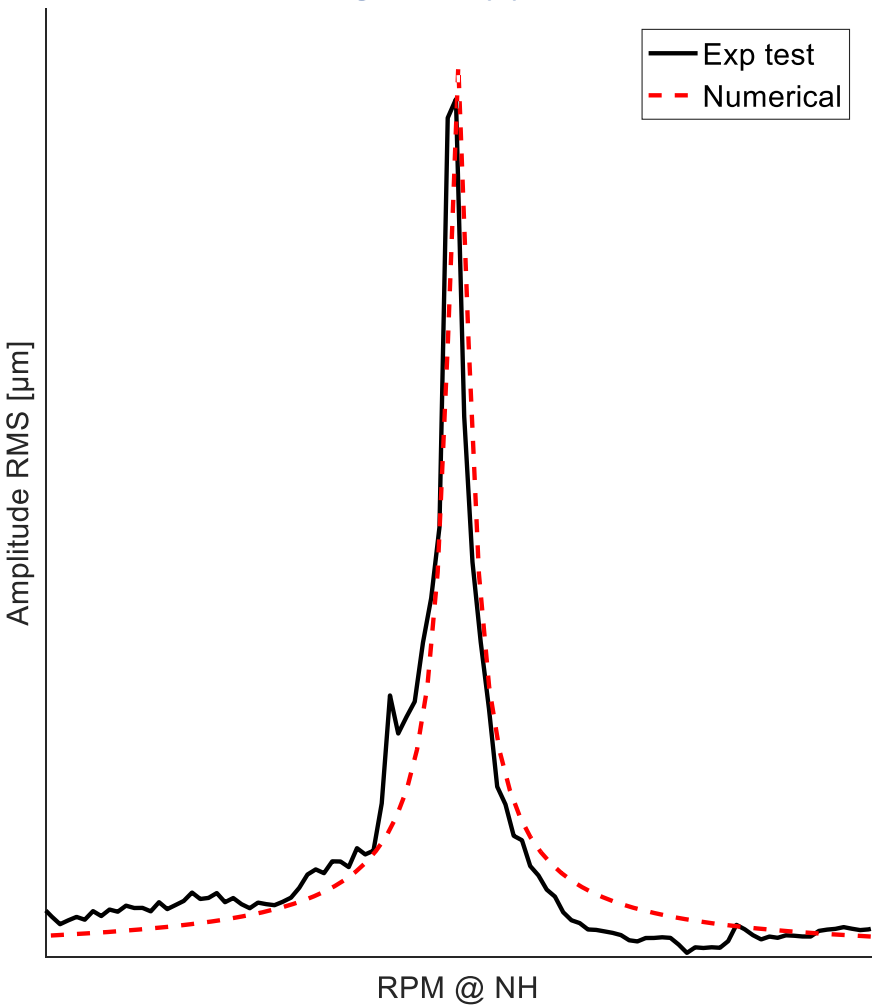


Flexible modes



3M Time-steps in 4hrs including pre-processing Results post-processing – Axial direction 2Z

3D BW



Politecnico di Torino
Department of Mechanical and Aerospace Engineering

