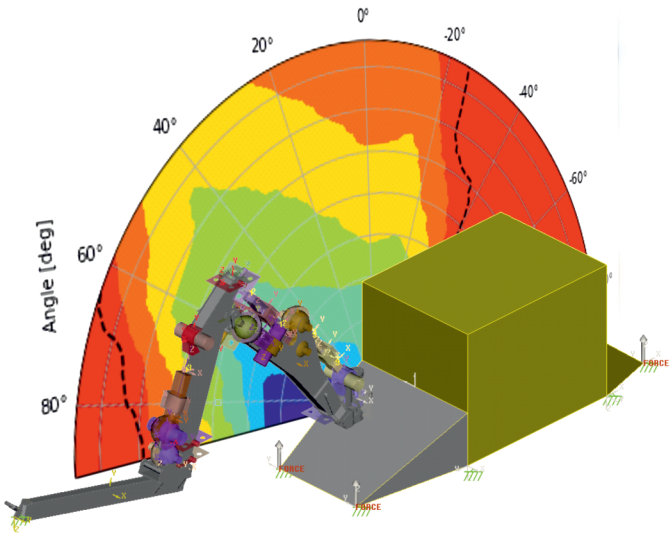
UNISO Technologies: Backhoe loader stability

Challenge

- Investigation of potential instability of the backhoe loader when the excavator unit and lift is operated within working range.



Approach

This project was performed by Uniso Technologies AB together with Huddig AB.

- With the aid of the ANSA Kinetics the mechanism and movement of the excavator was setup and reaction forces at supports within operating range calculated.
- A Design of Experiment was performed to cover the possible combinations of positions for the excavator.
- SFORCE was used to identify the contact between wheels and ground and calculate the reaction force.

Results - Benefits

- Custom post processing scripts for detection of instability.
- Pareto plots for individual cases.
- Automized Stability plots with safe working area.

"To be able to run ANSA Kinetics with a DOE made it possible to investigate a large number of combinations of positions and cases in a time effective way. With ANSA Kinetics, ANSA has evolved from a general purpose pre-processor to a powerful simulation tool for us to deliver results".

Malin Fredriksson, CAE-engineer, Uniso Technologies.