Problem statement

Multi parameters systems are defined as having more than one parameter that can influence the systems behaviour. Here the effect of adding a second independent load parameter was analysed. Such systems have more complex equilibrium states and thus also require more advanced path following techniques.

Equilibrium surfaces

- The equilibrium state is transformed from a path to an equilibrium surface in four dimensional space.
- Two visual configuration are used to represent this surface.

Multi-parameter tracing algorithm examples

- Load control algorithm
  - Control the relative change of the load increments in the form of a sin function by varying \( \alpha \) between -1 and 1.

- Critical boundary tracing algorithm
  - Tracing both critical boundaries for a pyramidal truss arch using a combination of extended systems and the arc length equation for multi parameter systems.
  - Left: Visualisation of all variables.
  - Right: Using the magnitude of the displacement vector.

Literature