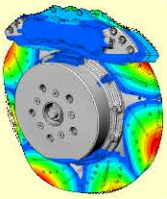
PERMAS

News in Version 16

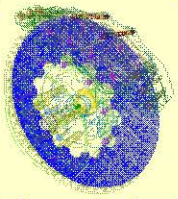
Brake squeal wizard

Model

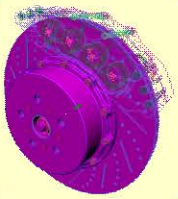


Complex mode shape

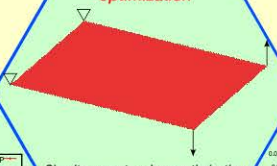
Transparency to see inner structure of brake disc



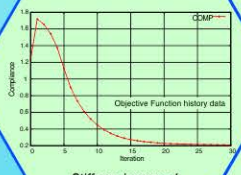
Transparency of caliper



Multi-modal optimization



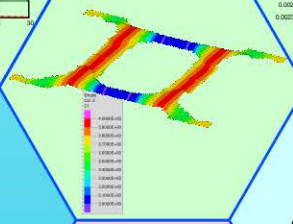
Simultaneous topology optimization, bead optimization, and free sizing for the sheet thicknesses



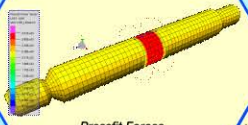
Stiffness increased by a factor of 6.

Weight reduction of 12.7%.

Blank with beads and varying thickness (color).

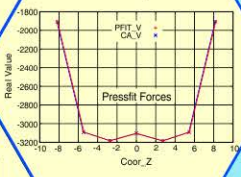


Press fit without contact

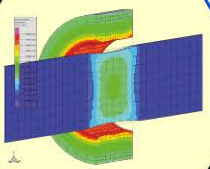


Pressfit Forces

Comparison with contact analysis ...

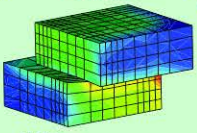


... shows identical results



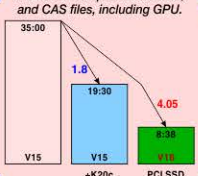
Direct I/O for large models with PCI SSD

Surface-to-surface contact

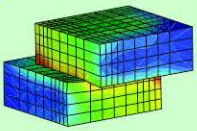


NONE
(= Surface-to-Node)
81 CA-Pairs
≈ 3.5 h (inaccurate)

Contact analysis with 56 Million DOF, 37 time steps, 2 different temperature states, and CAS files, including GPU.

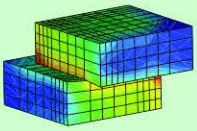


... with COMPLEMENT option



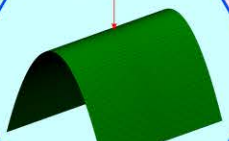
AUTO
113 CA-Pairs
≈ 4 h (accurate)

Run times are taken from a large industrial example.

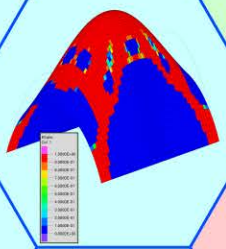


ALL
(= Surface-to-Surface)
162 CA-Pairs
≈ 22 h (accurate)

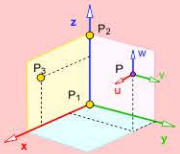
Multi-modal optimization



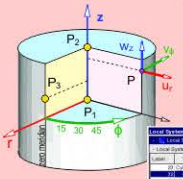
Simultaneous topology and shape optimization



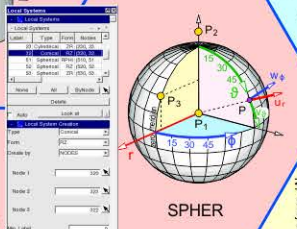
Local coordinate systems



CART



CYL

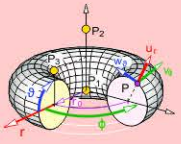


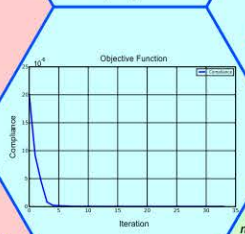
GEOS

SPHER

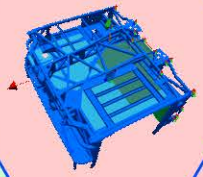
CONE

TOR



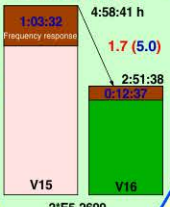


Geometrical nonlinear analysis

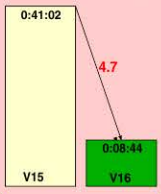


New modal frequency response solver

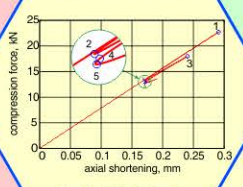
11350 modes
600 excit. freq
54 load cases



Run time reduction for a 3 Million DOF shell model (in minutes)

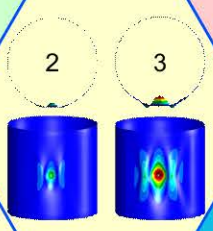


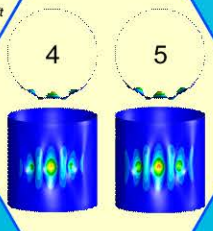
Nonlinear buckling



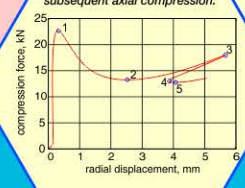
Post-buckling behavior of a laminated cylinder shell

Shape of cylinder shell at the positions in the graphs shown on the left





... under a radial node force as imperfection and subsequent axial compression.



... as busy as a bee!

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