

The full quadratic response passes its audit

C14 actual result / C15 next controlled probe / 19 October 2026

The completed connection calculation now passes all planned retained-state response checks. It is the numerical reference for this mesh, fixture and contact model. The next test isolates sensitivity to the normal contact penalty.

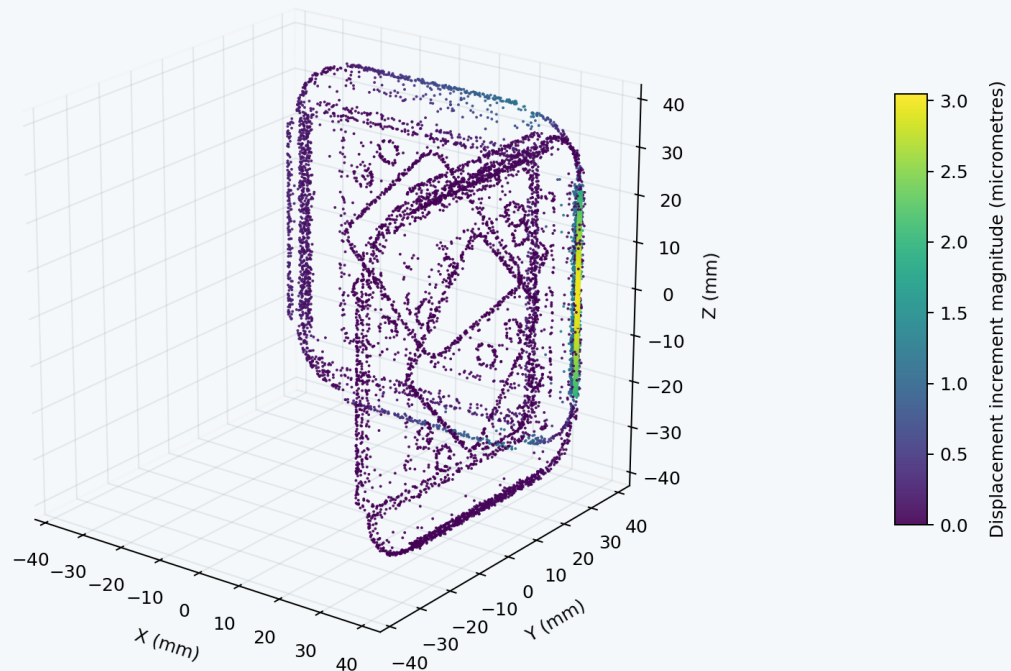
3,792,890
element-state checks passed

0
support-motion / table
violations

142 seconds
read-only PC audit

fabets | computed connection response

1 N applied load | step 9 minus unloaded step 3



9,510 sampled native-result nodes, shown at their undeformed positions.

C13 result independently audited by C14. Mesh/penalty convergence and beam capacity remain pending.

Colour shows the native displacement increment magnitude under 1 N, relative to retained unloaded step 3. The 9,510 sampled nodes are at undeformed positions. Load-weighted X increment: 2.422 micrometres. This is a computed displacement illustration; physical joint stiffness and metre-beam capacity remain unaccepted.

All 758,578 curved C3D10 cells pass the sufficient whole-domain Jacobian screen at each of five retained states. The smallest uncertainty-adjusted lower bound is $1.69237e-7 \text{ mm}^3$. All retained force/moment checks pass; exported support motion is zero.

C15: change one numerical parameter

A successful calculation can still depend on the chosen contact penalty. C15 increases only the shared normal contact spring slope by a factor of ten. It then audits and compares the result automatically.

Item	Verified baseline	C15 probe
Normal penalty	1e6 N/mm ³	1e7 N/mm ³
Contact pairs	19	Same 19
Mesh / material / clamps	C13 reference	Unchanged
Loads / nonlinear controls	Eleven-step history	Identical full deck
Native backend	Pinned PaStiX / CPU	Same build / 4 threads
Postprocessing	C14 completed	Automatic in this job

Comparison and acceptance

At 0.001, 0.1 and 1 N, compare displacement increments relative to each run's own settled zero-load state. The declared engineering probe target is a change of no more than 2% in both displacement and apparent secant. It is not a universal accuracy criterion. Two penalty levels do not establish mesh or bending convergence.

The C14 force/moment and curved-element auditors are reused byte-for-byte from the successful PC run. A failed mechanical or geometry gate prevents an accepted comparison. Both tiny-load return metrics remain: the baseline return difference is 0.003515% of peak, but 3.506% of the first 0.001 N increment. Final load is not zero.

Run once, return one ZIP

Extract the C15 package and double-click RUN_C15_PENALTY.cmd. Keep the original C11 folder. Smoke test, native calculation, result audit and comparison run in sequence. Return FABETS_C15_Result_....zip, including failures. No second manual audit program is needed.

The native stage has a monitored ten-hour budget; preparation and audit are additional. This version uses the requested eleven-hour absence with nominal headroom. Existing running jobs retain their original deadline. Keep the PC awake. In-run output goes to Monitor_C15.txt so interactive console output cannot block monitoring through print. Sample gaps and late completion observations are flagged. This does not establish the cause of C13's earlier monitoring gap or guarantee hard real-time control through OS stalls.

What is verified here

Actual full-model reverse proof and unchanged load deck pass. The reused auditor identities are verified. Positive/negative comparison fixtures and a real synthetic timeout with an inaccessible interactive sink pass. The higher-penalty Windows solve has not run here; its sensitivity result remains unknown. Mesh/contact representation, bending/coupling, material strength and cable prestrain remain before a 1 m / 90 kg beam claim.

Provenance: actual FABETS_C14_Audit_Result_20261019T152739Z.zip, CRC checked. Full source hashes, input proof, validation and complete prior project context are included in the accompanying text record. Primary implementation checked: www.dhondt.de/ccx_2.23.src.tar.bz2 (surfacebehaviors.f).