



Shipping box and detector shipping

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The issue

- Although the specifications for the design of the shipping box were available since the LS PDR, for various reasons the work did not advance enough on this topic.
- As you know, there is a reference shipping PSD (Power Spectral Density) and the design acceptance criteria has been defined (stress from shipping $< 1/10$ admissible stress in the structure)
 - The work seems to be easy: design a shipping box and its dumping system so that the reference shipping excitation spectrum does not generate in the detector structures stresses above what specified.
 - Needs to design the shipping box, evaluate its dynamic response and, finally, tune up the dumping mechanism to isolate the frequencies that might cause high stresses.
- All we have at the moment is a preliminary design of the bottom box panel. Some crude estimate of its resonance frequency but no work has been done on the dumping system nor on the stresses estimate in the detector.
 - Since the bottom panel of the box is part of the assembly tool (which is embedded in the floating floor of the clean room) the structures below it became now urgent



Historical

- After the preliminary calculations made by Sandro both the design and calculation work have stopped.
- This type of simulations needs experts in the fields. I tried to get help approaching experts and I also inquired the new engineers working for us at CERN.
- Unfortunately, none of the solutions worked out.



My proposal

- Milano is actually looking forward to a full simulation of the entire EndCap under gravitational and thermal loads.
- To handle such a large model new hardware is required. Mainly a powerful enough computer to fit the numbers of “nodes” of such a model. The ordering process is already in place.
- Given that fact that Milano (Mauro) has already the expertise on complex simulations and shortly should have also the computational power to handle large models, I really would like they take over also this computational task.
 - On top of the ones that Milano is already following
- Please note that the design work of the shipping box is not covered yet. FEA are based on designs and, at the moment, the design is not available yet.
- I therefore would like to trigger an open discussion to try to cover this tasks.