

Dan Peterson: News on Advanced Endplate Mechanics
2009-03-18

2009-03-04, reported on design of the hybrid (aluminum/carbon fiber) design:

7.35 kg Aluminum, **1.29 kg** carbon, for LP1, 0.072 X₀.

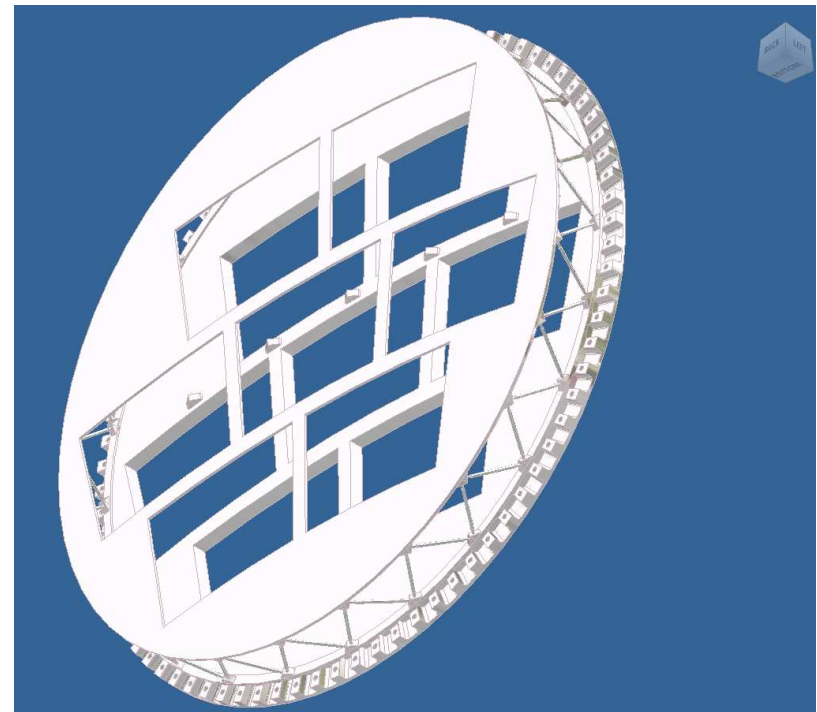
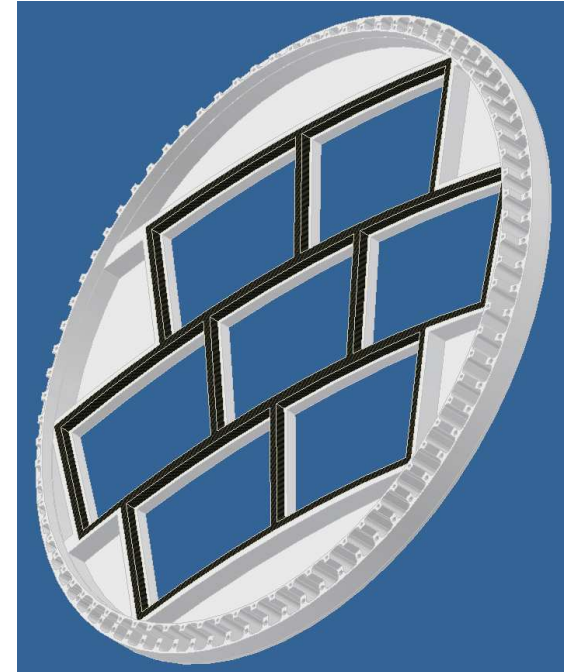
Compares to **18.87 kg** aluminum for the current LP1 endplate.

Current work is on a space-frame design.

The design is not complete; there will be more rows of bars between rows. (You can see the mount points above row #2.)

The design is “one piece” in the current model allowing it to be used for stress analysis. In reality, this would be an assembly.

Mass is currently 12kg, but will be reduced to about **8 kg** after thinning the uninstrumented areas.



The bars are adjustable, with threads on both ends of different pitch. For example, 1mm on one end and 1.25mm on the other provides 0.25mm/turn sensitivity. This is a method I have used before.

I am not using a web of bars to span the rear portion; there is a second, very thin plate. This will make manufacture and alignment easier. There are opening to allow access to the modules.

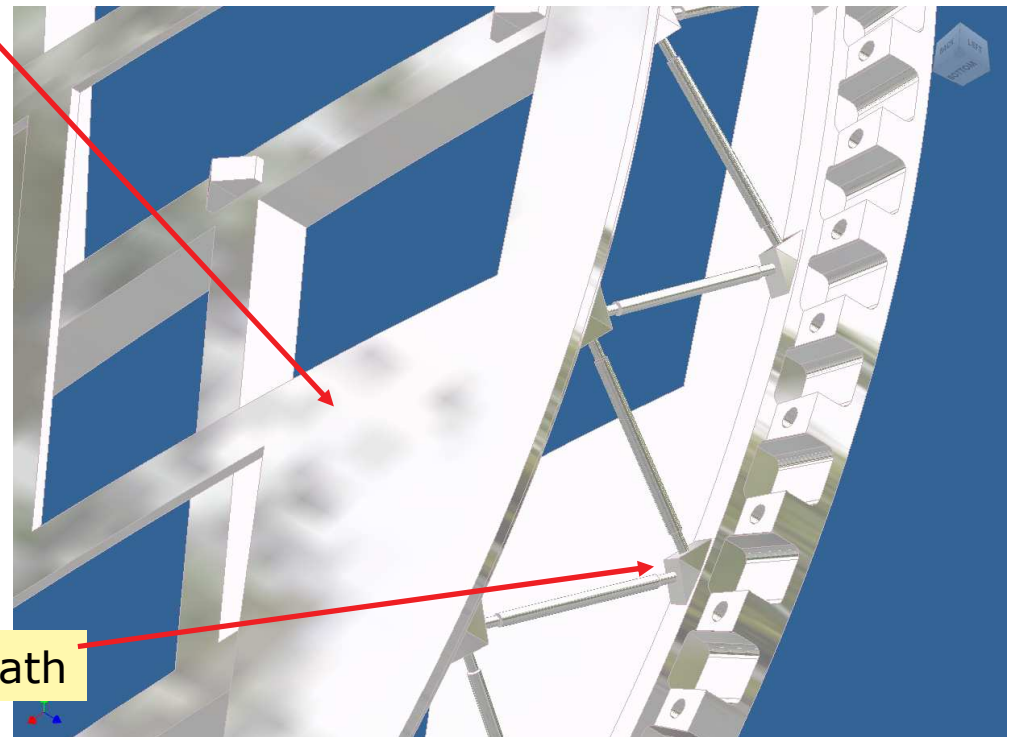


This design is likely to scale to the ILD endplate better than the hybrid.

A full ILD endplate will be modeled as part of the evaluation. (Many of the difficulties of the LP1 endplate design are due to the edge effects.)

The next step is the FEA analysis of the LP1 model.

I believe that this design can be built within the budget.



lots of math