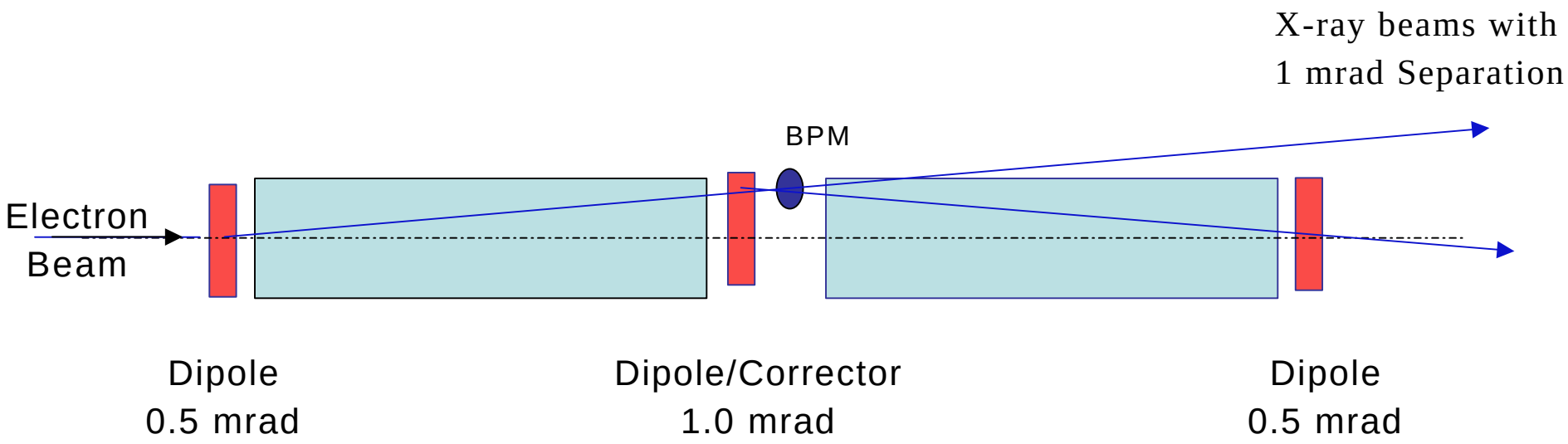
Canted Undulator Beamline

Patric Den Hartog

TWG Meeting

March 21, 2002

Canted Undulator Layout



Canted Undulator Major Features

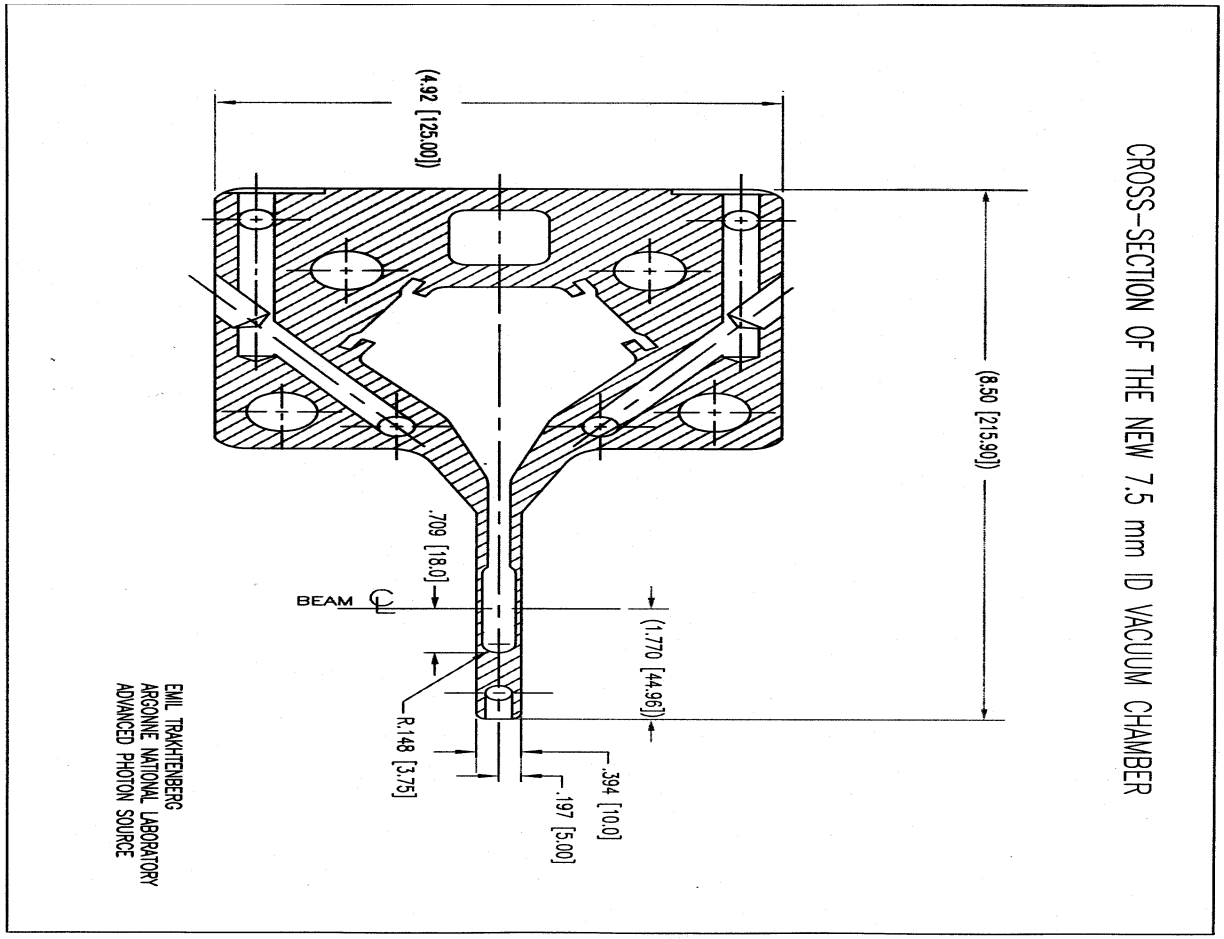
- 1 mrad separation between beamlines
- Two 2.07 m long UA (3.3 cm period)
- 200 mA operation at K=2.78 (10.5 mm)
- Electromagnet dipoles and correctors
- New 7.5 mm aperture ID VC with center BPM and step-less RF transition
- New Vs. 200C FE design

X-Ray Beam Specification

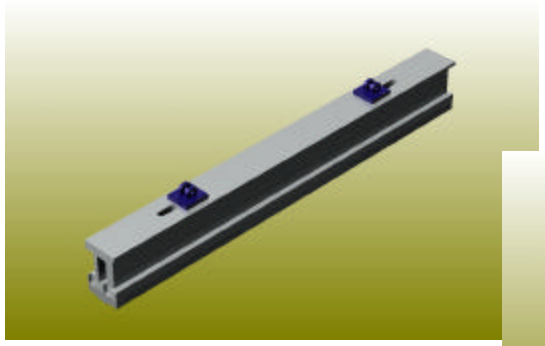
The Front End version 200c is designed for the dual canted undulator with 1 mrad horizontal separation to be operated at maximum current of 200 mA.

Maximum beam current:	200 mA
Length of each undulator	2.07 m
Undulator period length λ	3.3 cm
Number of periods N	62 (with 60 active)
Maximum deflection parameter K	2.8 (corresponding to 10.5 mm gap)
Horizontal beam size σ_x	352 μm
Vertical beam size σ_y	18.4μm
Horizontal beam divergence $\sigma_{x'}$	22 μrad
Vertical beam divergence $\sigma_{y'}$	4.2 μrad
Total power emitted from each undulator	10 kw
Total power emitted from dual undulators	20 kw
Peak power density at normal incidence	276 kw/mrad^2

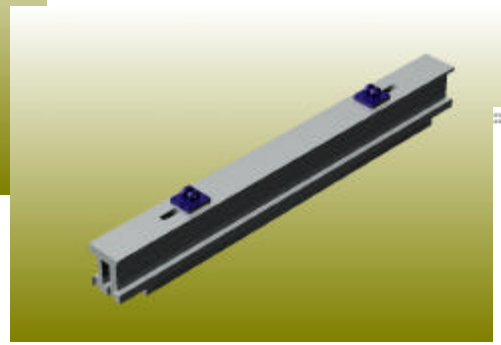
New 7.5 mm VC Extrusion



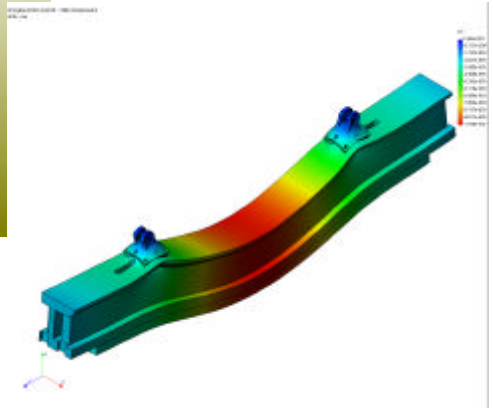
Undulator strong-back – as it used to be…



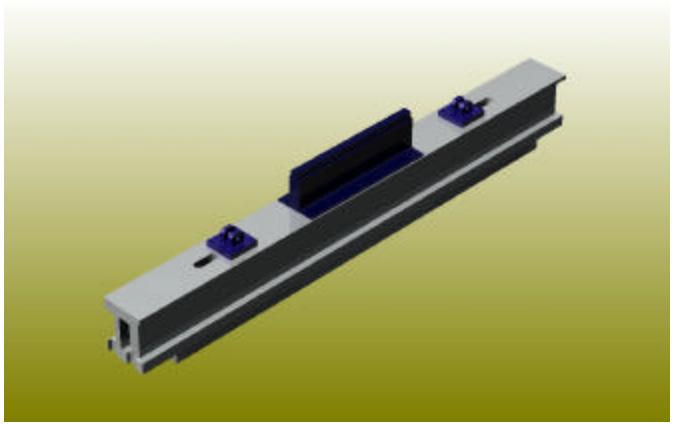
Undulator strong-back – as it has to be…



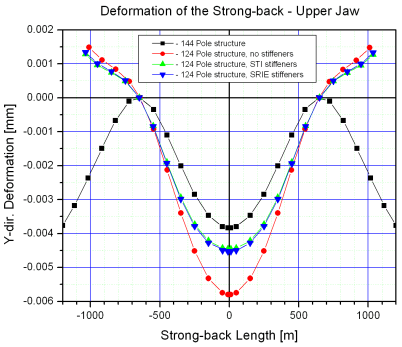
And this means that….

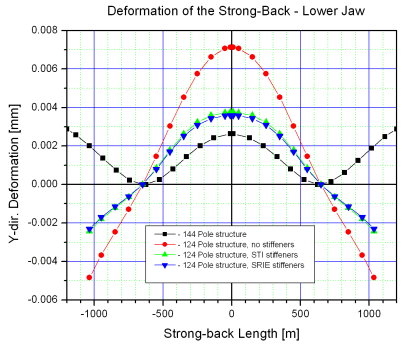


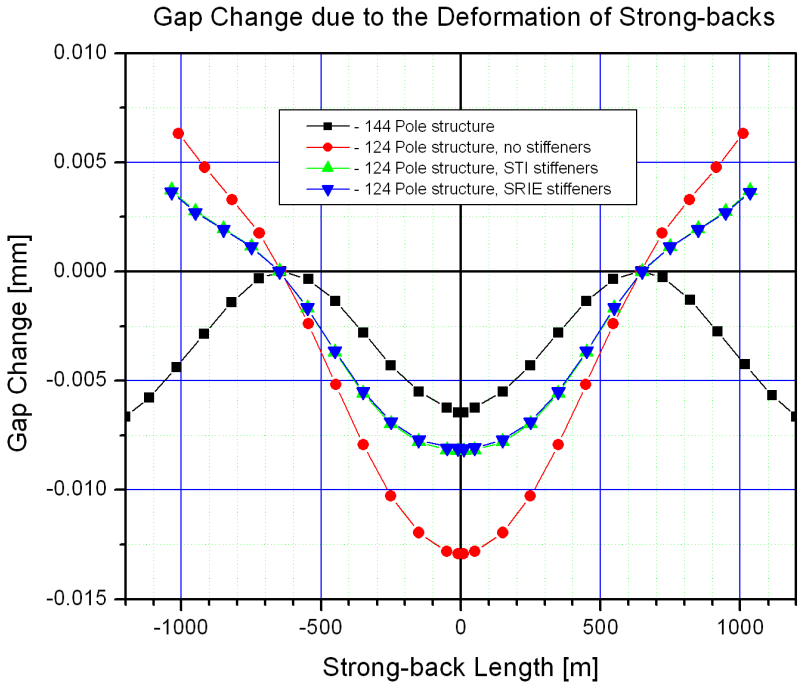
So do we have to…?



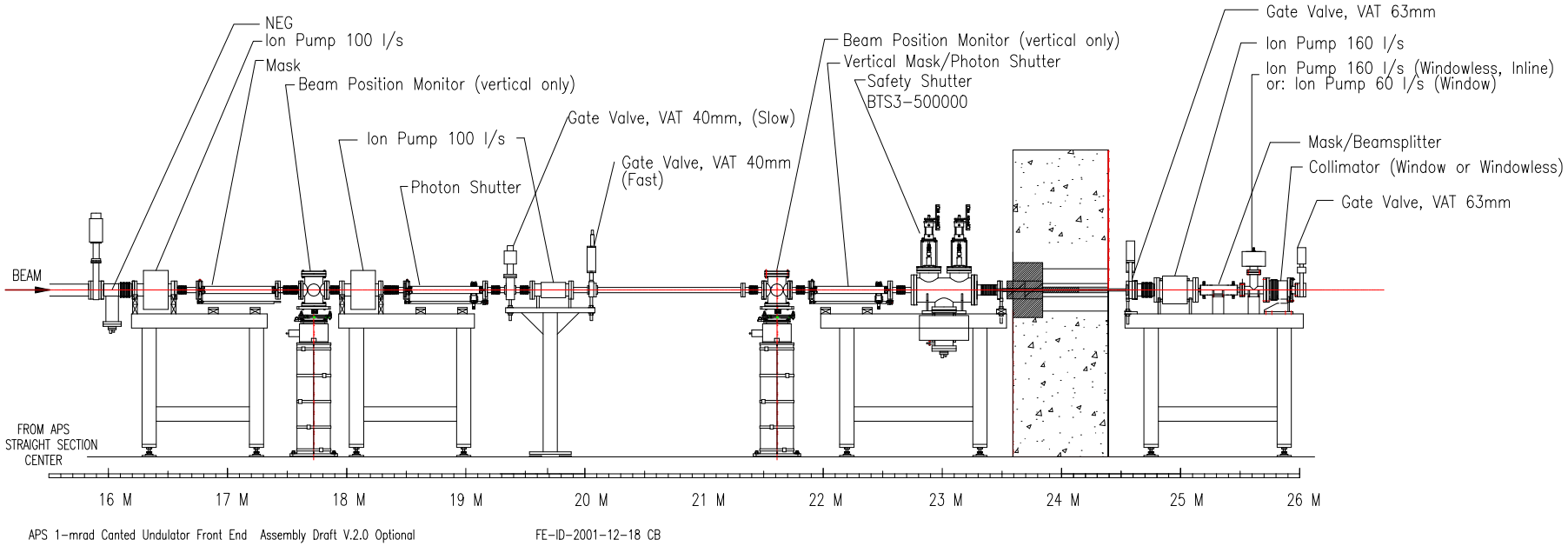
…Probably not !



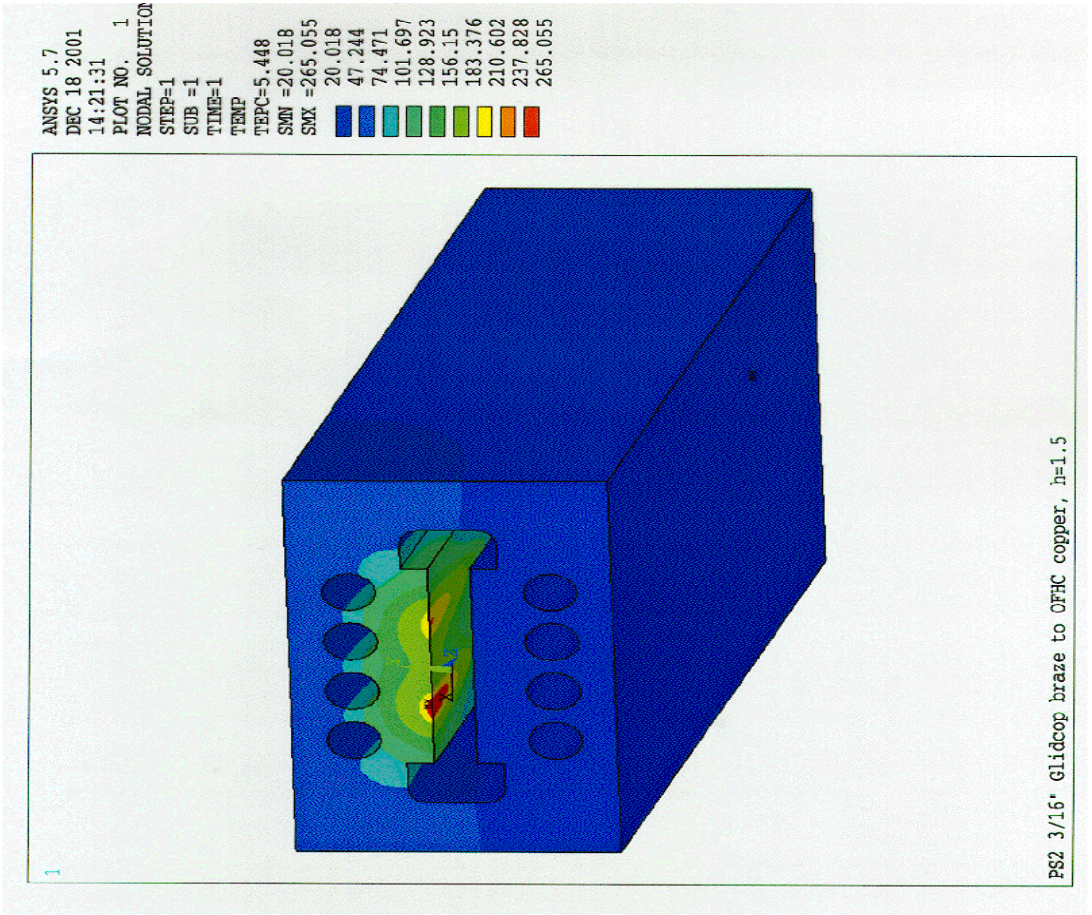




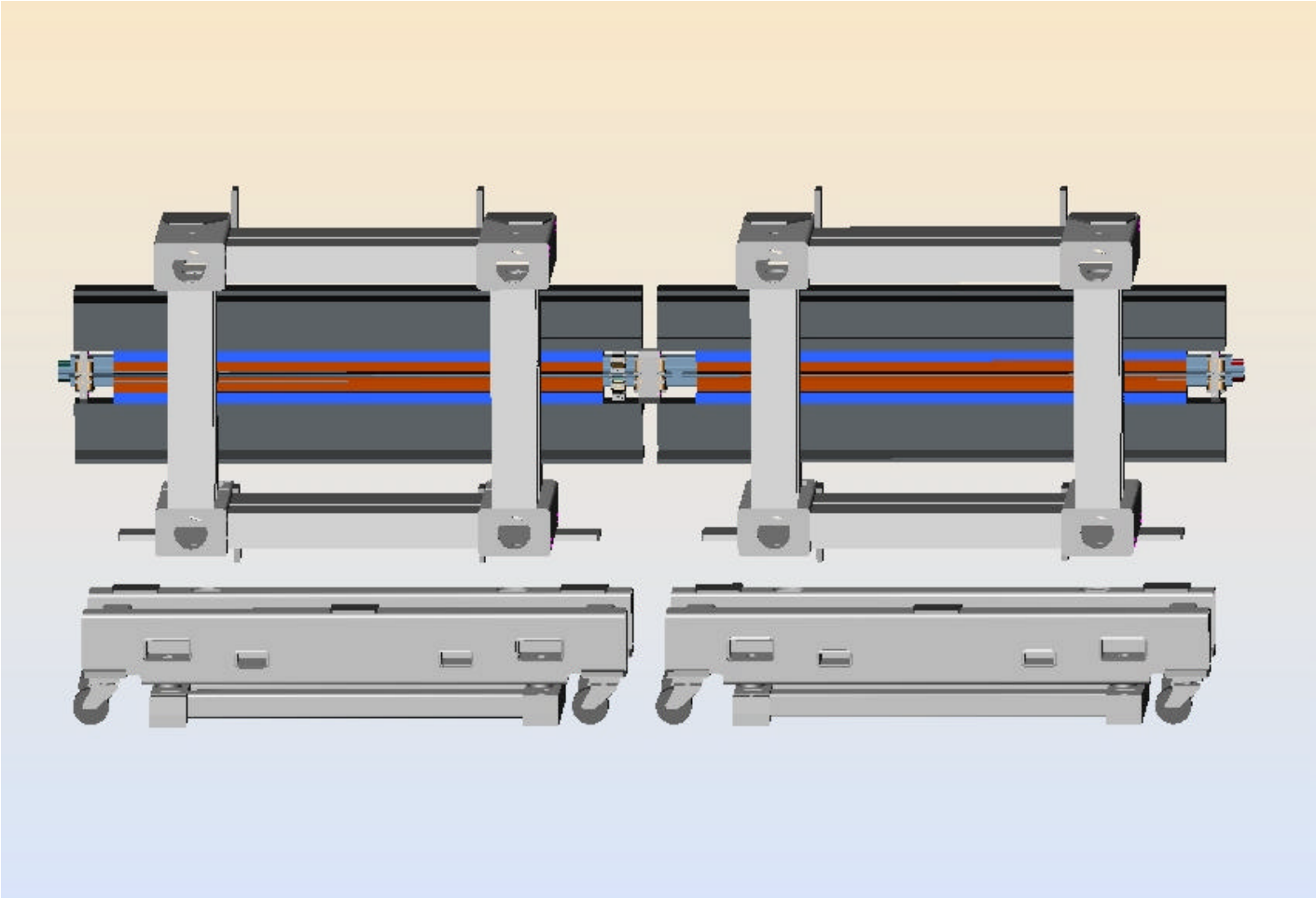
Canted Undulator FE Layout



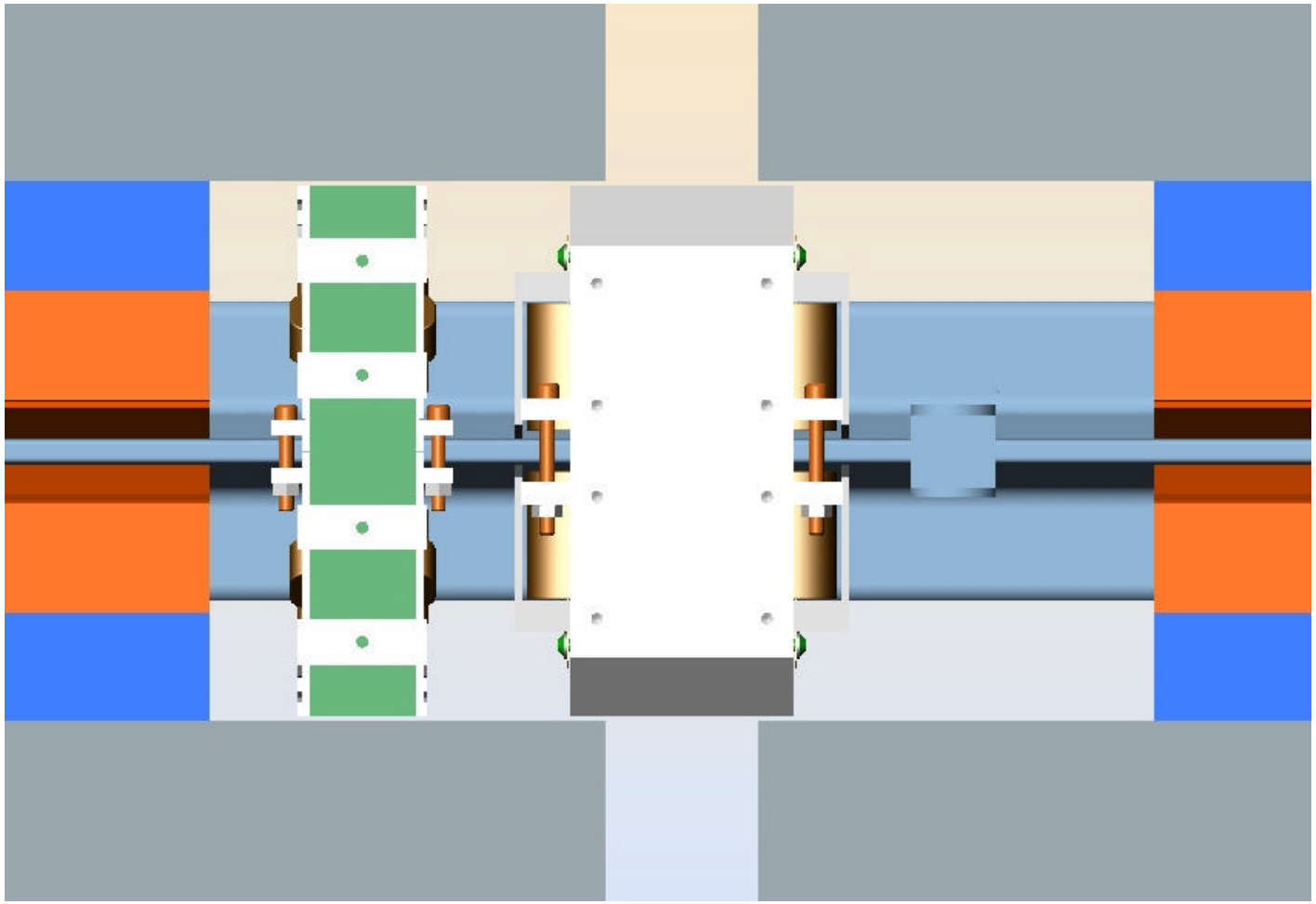
Thermal Analysis of PS2



Double Undulator Configuration



Corrector, Dipole, and BPM



Canted Undulator Status

- Set to begin procurement of long-lead items when funding available
- ID VC extrusion ready for production run
- Modification of magnetic structures on order from STI will reduce lead time
- First ID & FE ready by 3rd Quarter 2003