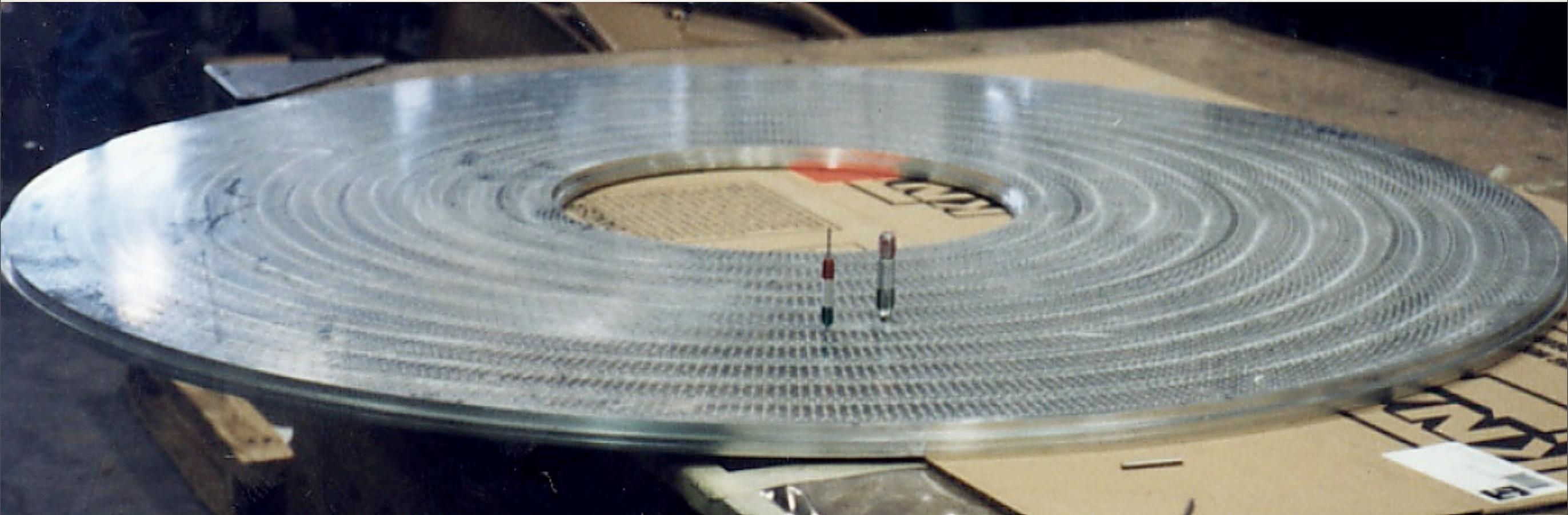


DCH Geometry



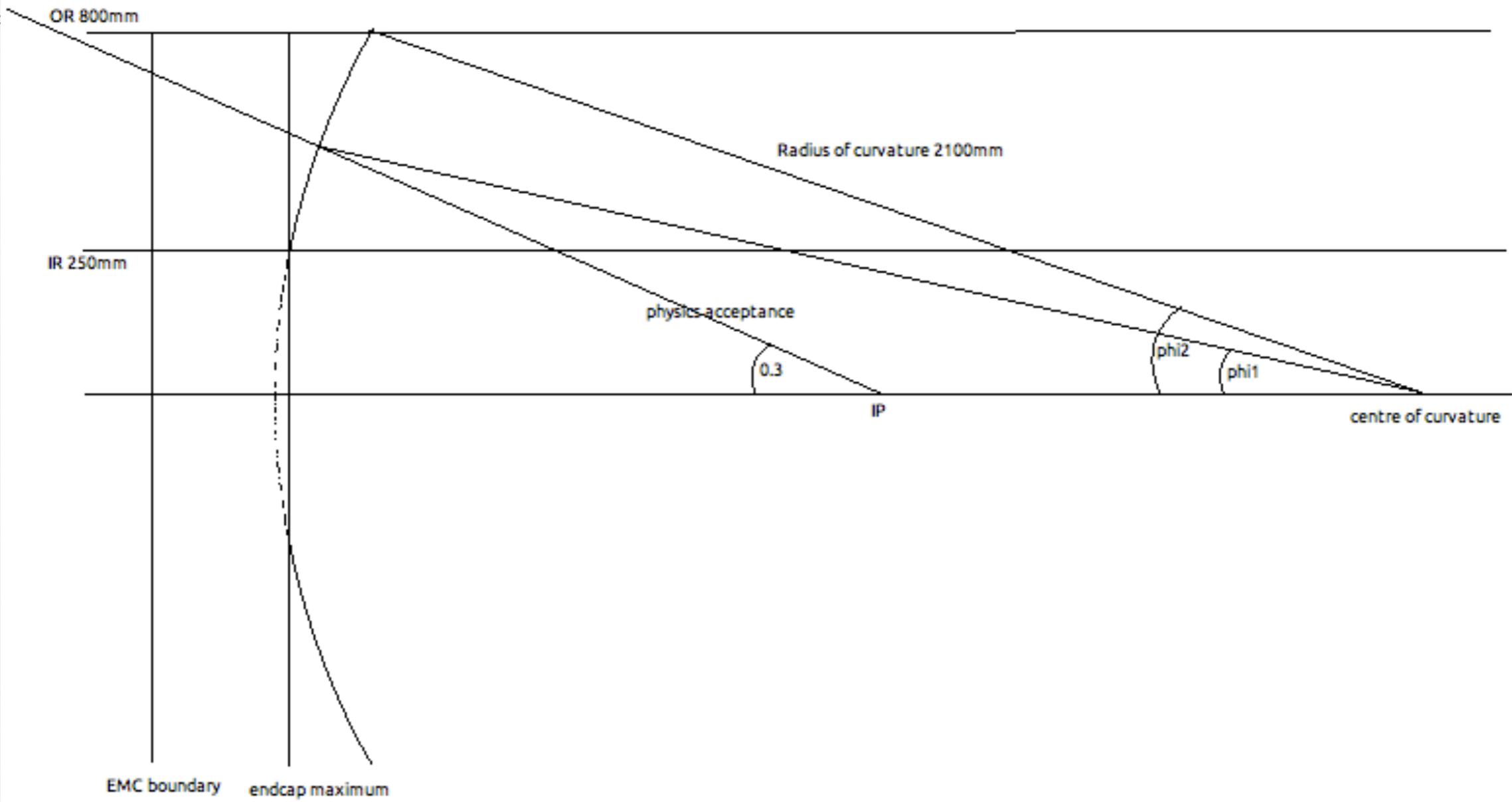
Jean-François Caron
3rd SuperB Collaboration Meeting, INFN-LNF

March 2012

Input Parameters (Stable)

- ❖ Outer radius of DCH: 800mm
- ❖ Inner radius of DCH: 250mm (gives 5mm clearance inside)
- ❖ Physics acceptance angle: 0.3 radians
- ❖ Radius of curvature of DCH endplates: 2100mm

Backward Endcap



Input Parameters for Backward Endcap (Unstable?)

- ❖ Inside edge of backwards EMC: -1320mm
- ❖ Clearance between backward EMC and DCH electronics: 10mm
- ❖ Space needed for DCH readout cables: 100mm
- ❖ Space needed for DCH readout boards, enclosures: 100mm
- ❖ Note that the previous three are just summed (210mm total), so there is flexibility.

Status in FastSim

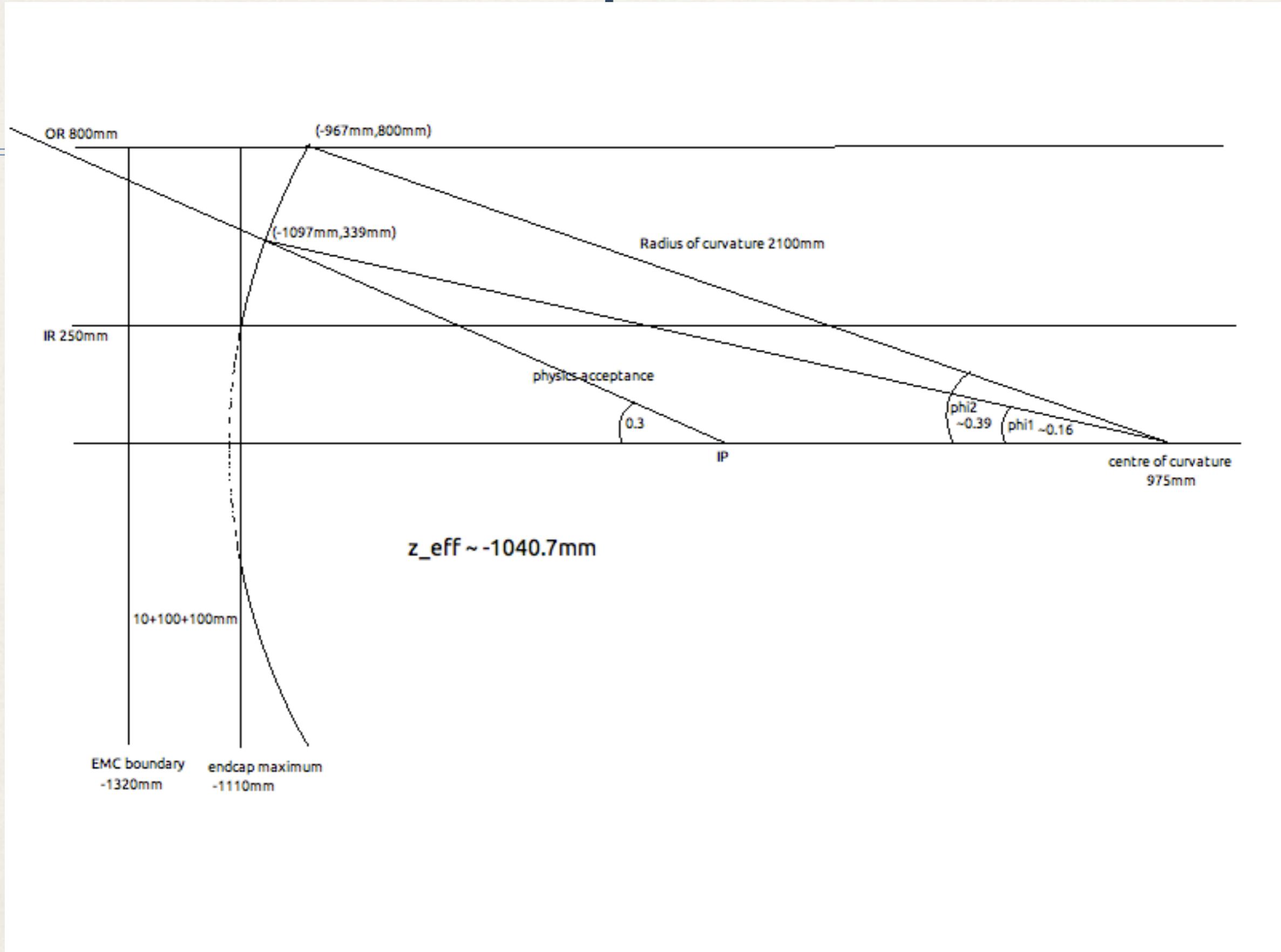
Backward EMC is represented by flat rings:

```
z="-133" lowradius="31" hiradius="75" thick="2"  
z="-135" lowradius="31" hiradius="75" thick="2"  
z="-137" lowradius="31" hiradius="75" thick="2"  
z="-139" lowradius="31" hiradius="75" thick="2"  
z="-141" lowradius="31" hiradius="75" thick="2"  
z="-143" lowradius="31" hiradius="75" thick="2"  
z="-145" lowradius="31" hiradius="75" thick="2"
```

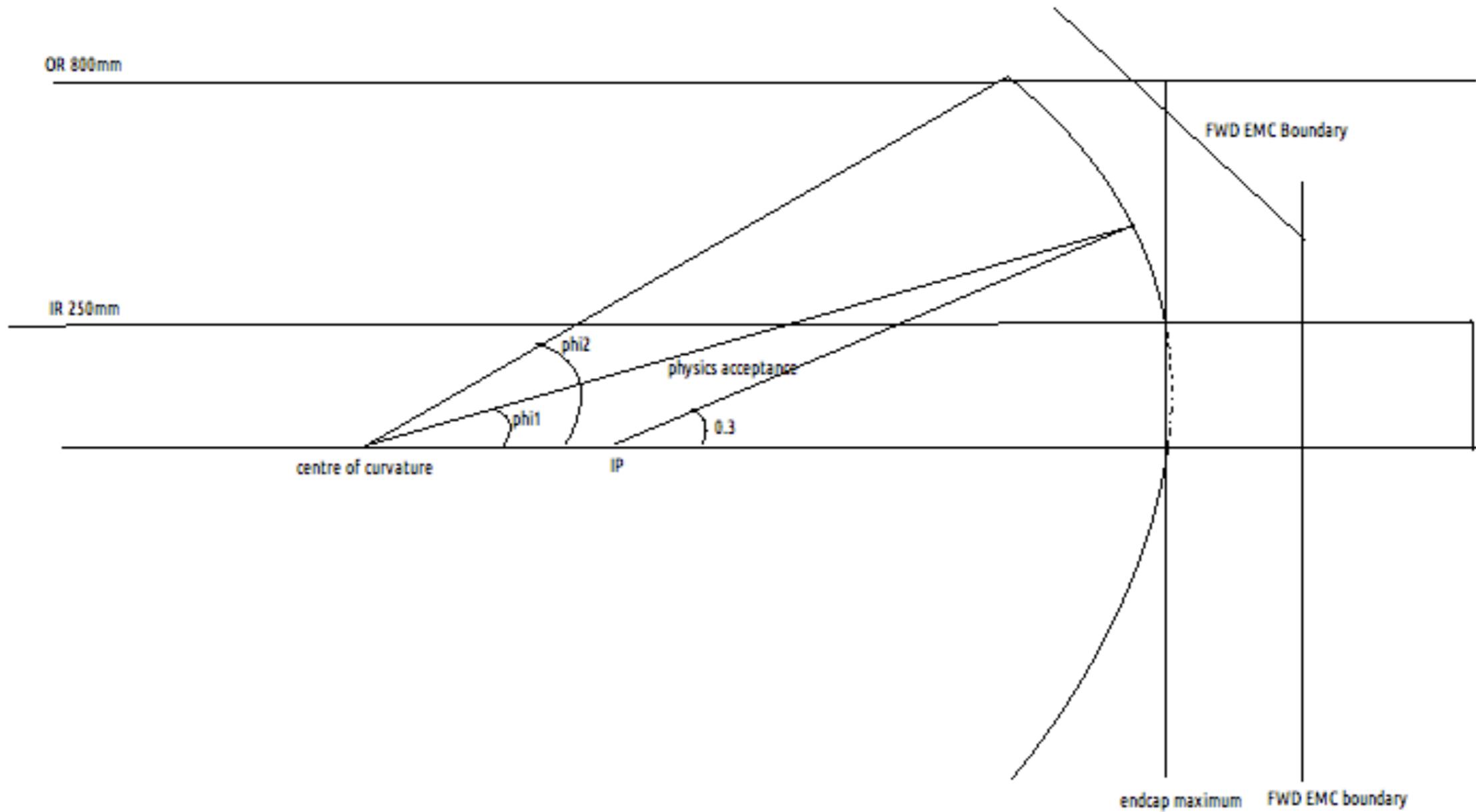
DCH is represented by cylinders and rings for endplates:

```
"wirezmin"="-101.5", "wirezmax"="174.9"  
cyl name="DchInnerCyl" " zmin="wirezmin" zmax="wirezmax" radius="23.60" thick="0.1000"  
cyl name="DchOuterCyl" zmin="wirezmin" zmax="wirezmax" radius="80.00" thick="0.1600" mat="dch-CFiber"  
cyl name="DchOuterCyl" zmin="wirezmin" zmax="wirezmax" radius="80.90" thick="0.0125" mat="dch-Aluminum"  
ring name="DchEndplate" z="wirezmin" lowradius="23.6" hiradius="80.9" thick="0.80" mat="dch-CFiber"  
ring name="DchEndplate" z="wirezmax" lowradius="23.6" hiradius="80.9" thick="0.80" mat="dch-CFiber"  
ring name="DchEndplate" z="177.6" lowradius="23.6" hiradius="80.9" thick="0.10" mat="dch-Aluminum"  
ring name="DchElectronics" z="-102.5" lowradius="23.6" hiradius="80.9" thick="0.10" mat="dch-Aluminum"  
ring name="DchElectronics" z="-116.5" lowradius="23.6" hiradius="80.9" thick="0.30" mat="dch-Aluminum"  
ring name="DchElectronics" z="-131.5" lowradius="23.6" hiradius="80.9" thick="0.40" mat="dch-Aluminum"
```

Backward Endcap



Forward Encap



Input Parameters for Forward Endcap (Unstable?)

- ❖ Limiting inner surface of forward EMC: 2000mm (difficult because it is sloping, while the DCH boundary is curved)
- ❖ Space needed for FPID: 50mm
- ❖ Clearance between forward FPID and DCH: 10mm
- ❖ Space needed for DCH high-voltage cables, boards, and enclosures: 70mm
- ❖ Again the previous three are just summed (130mm total)

Status in FastSim

Forward EMC represented by cones:

```
rho1="51.1864" z1="199.747" rho2="93" z2="182.256" thick="1"  
rho1="51.5627" z1="201.215" rho2="93.6837" z2="183.596" thick="2"  
rho1="52.1899" z1="203.663" rho2="94.8233" z2="185.829" thick="3"  
rho1="53.068" z1="207.089" rho2="96.4187" z2="188.955" thick="4"  
rho1="54.0715" z1="211.005" rho2="98.242" z2="192.529" thick="4"  
rho1="54.9496" z1="214.432" rho2="99.8373" z2="195.655" thick="3"  
rho1="55.5768" z1="216.88" rho2="100.977" z2="197.888" thick="2"  
rho1="55.9531" z1="218.348" rho2="101.661" z2="199.228" thick="1"
```

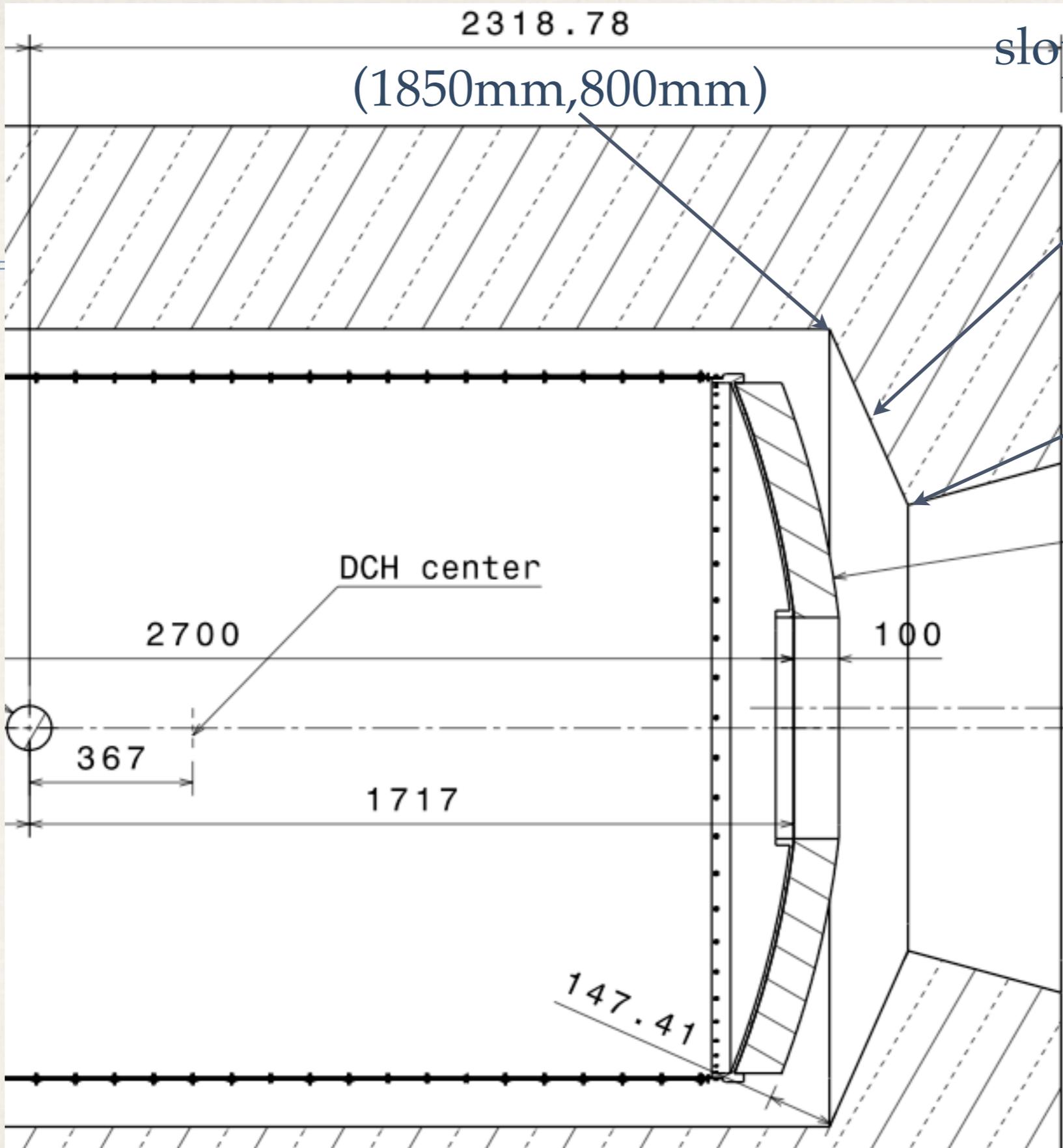
DCH is represented by cylinders and rings for endplates:

```
"wirezmin"="-101.5", "wirezmax"="174.9"  
cyl name="DchInnerCyl" zmin="wirezmin" zmax="wirezmax" radius="23.60" thick="0.1000"  
cyl name="DchOuterCyl" zmin="wirezmin" zmax="wirezmax" radius="80.00" thick="0.1600" mat="dch-CFiber"  
cyl name="DchOuterCyl" zmin="wirezmin" zmax="wirezmax" radius="80.90" thick="0.0125" mat="dch-Aluminum"  
ring name="DchEndplate" z="wirezmin" lowradius="23.6" hiradius="80.9" thick="0.80" mat="dch-CFiber"  
ring name="DchEndplate" z="wirezmax" lowradius="23.6" hiradius="80.9" thick="0.80" mat="dch-CFiber"  
ring name="DchEndplate" z="177.6" lowradius="23.6" hiradius="80.9" thick="0.10" mat="dch-Aluminum"  
ring name="DchElectronics" z="-102.5" lowradius="23.6" hiradius="80.9" thick="0.10" mat="dch-Aluminum"  
ring name="DchElectronics" z="-116.5" lowradius="23.6" hiradius="80.9" thick="0.30" mat="dch-Aluminum"  
ring name="DchElectronics" z="-131.5" lowradius="23.6" hiradius="80.9" thick="0.40" mat="dch-Aluminum"
```

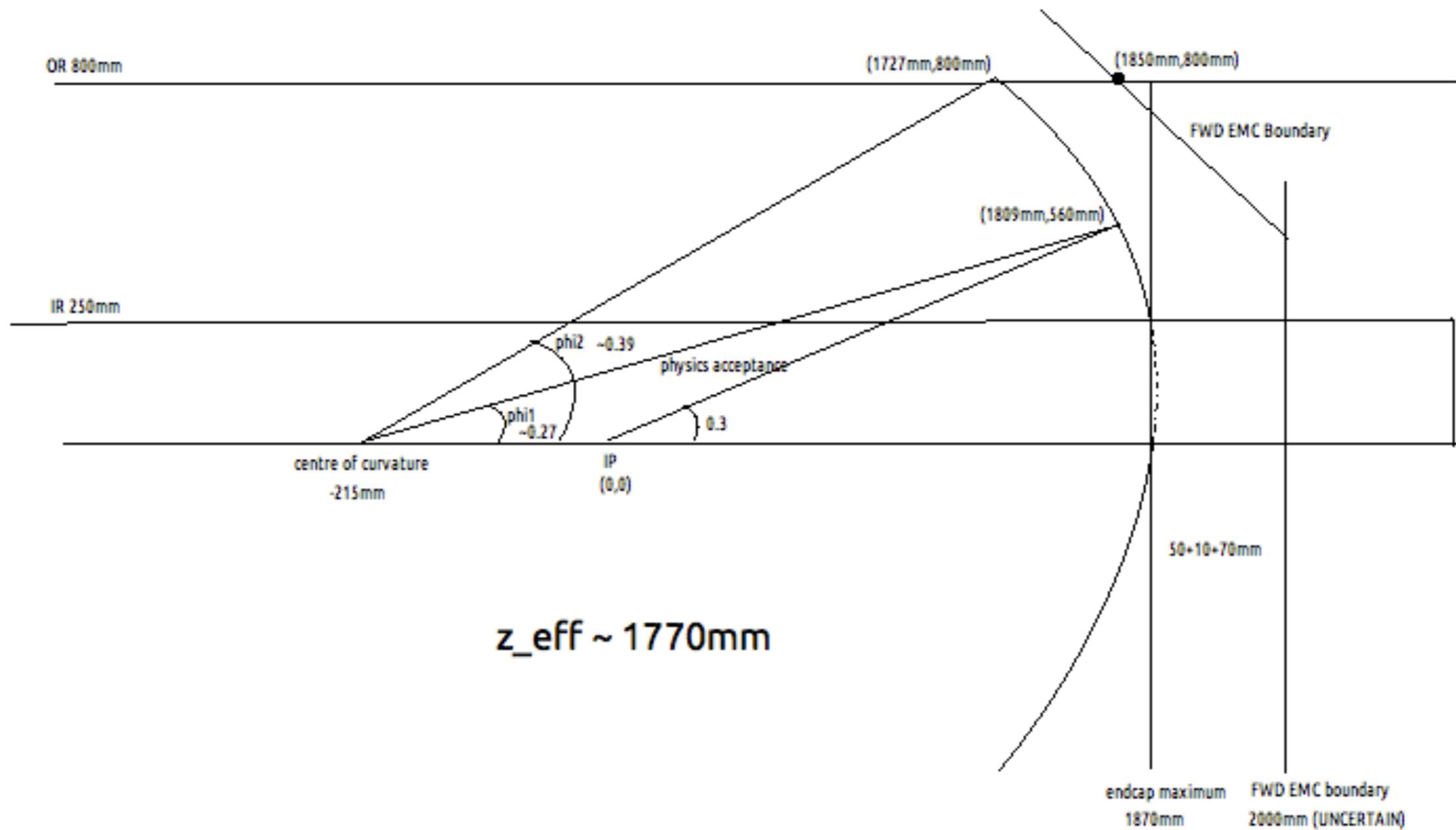
The exact location and slope of this boundary is critical

Taken to be at $z=2000\text{mm}$

FWD electronic



Forward Endcap



Proposed Changes

- * Change inner radius to 250.5mm (from 236.0mm) with 1mm thickness
- * Change the backward endcap position (and “wirezmin”) to -1040.3mm (from -1015mm) with 0.8mm thickness
- * Change forward endcap aluminium shell position to 1769.5mm (from 1776mm) with 1mm thickness
- * Change “wirezmax” to 1742.5mm, from 1749mm
- * Change depth of DchElectronics component at backward endplate to 2x100mm (from 1+3+4mm), extending from -1110mm to -1310mm
- * Add 70mm DchElectronics component at forward endplate (currently nothing), extending from 1870mm to 1940mm