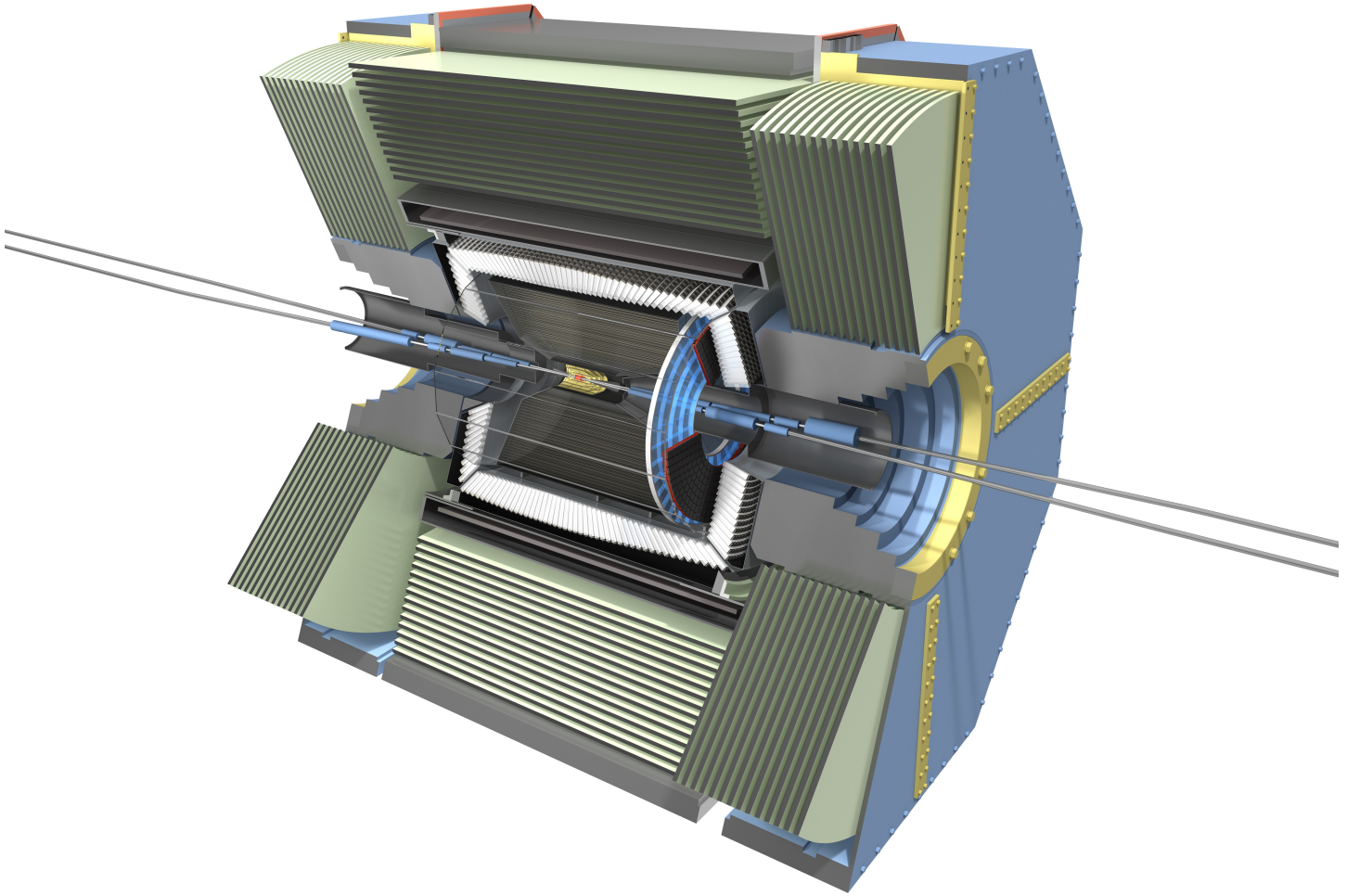
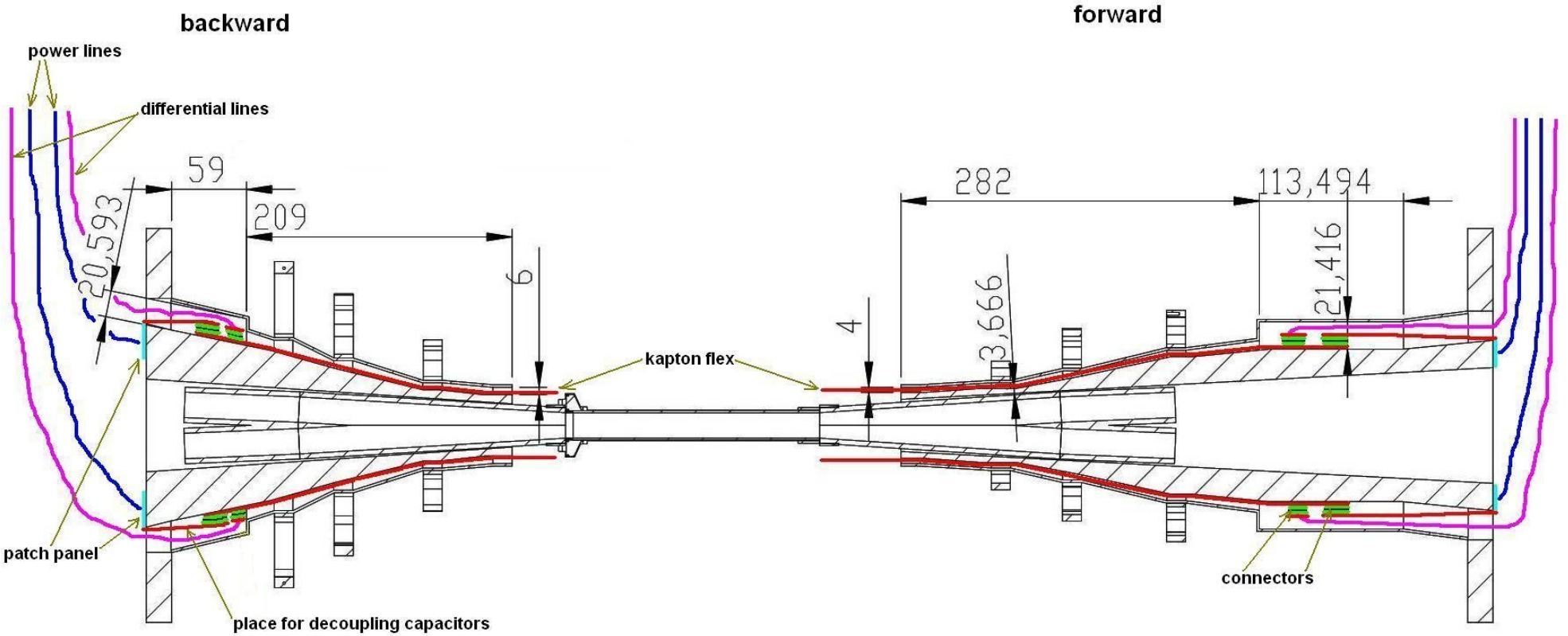
Update on Services



Overview PXD connection



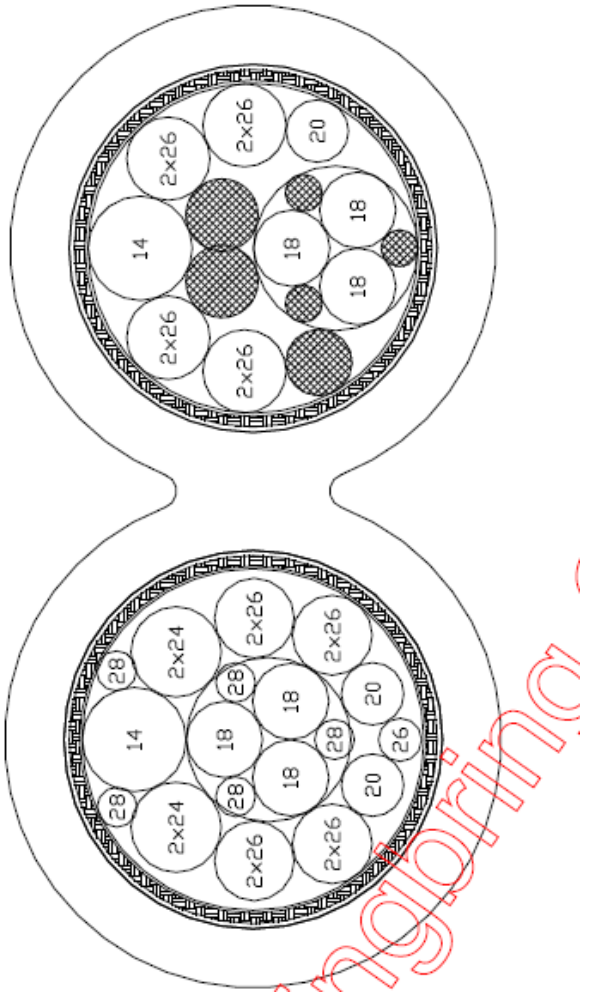
Power connection: 20 power cables on each side, connecting power supplies to patch panels (Distance: ~ 15m)
Fast link connection: twisted pair cables

On patch panel level there is space for decoupling capacitors (package 0805).
Connection: PP to PXD with kapton flex – different length for backward respectively forward side.

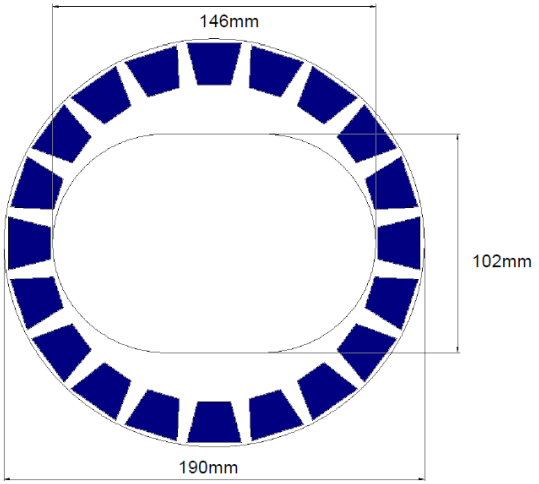
Power cable

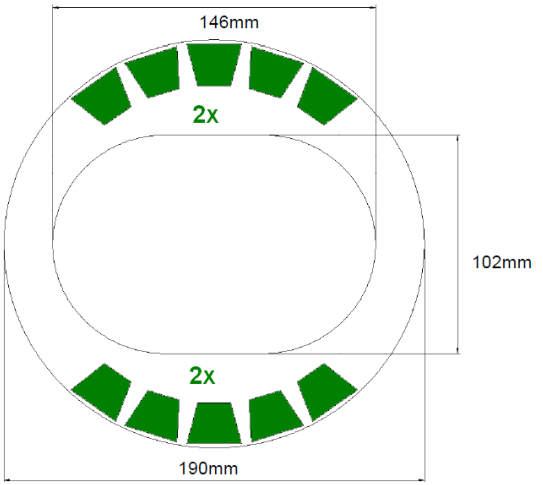
New design for cable:

- AWG14/18 instead of AWG12
- Forward service space required to limit diameter (minimum channel width 22mm)
- Radiation hard till 50MRad (according to company)
- Double cable with 14.5 mm diameter



Patch panel arrangement

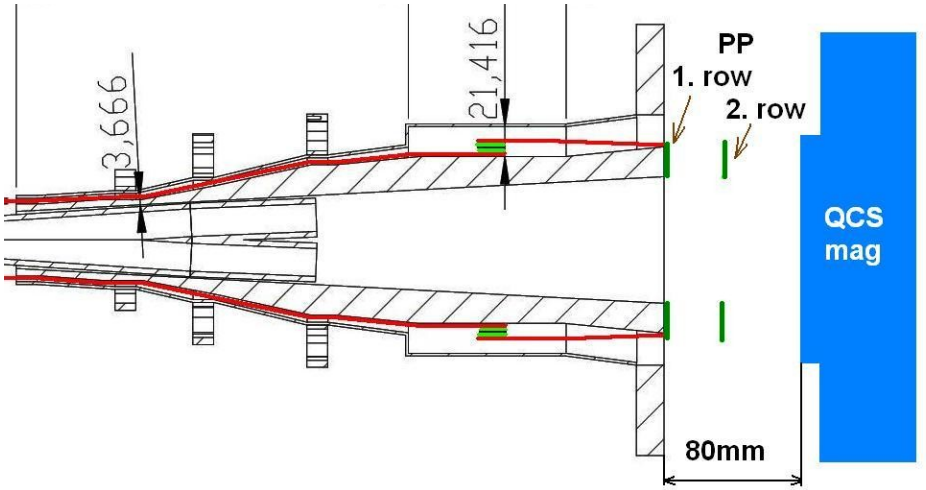




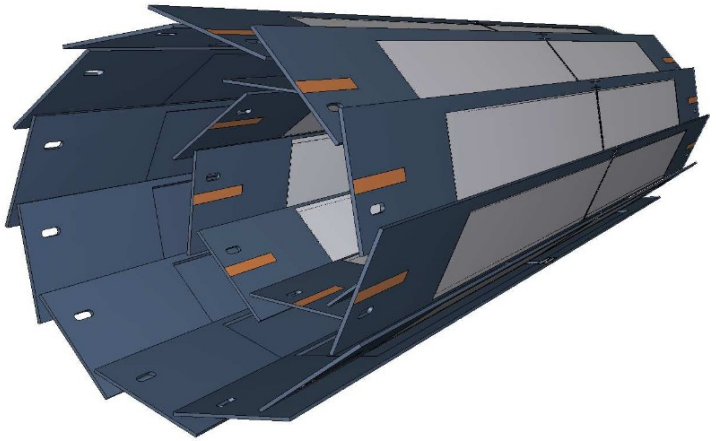
20 patch panels arranged on a circle fixed to the beam pipe.
Space problem – no space under the carbon cone for the cables !

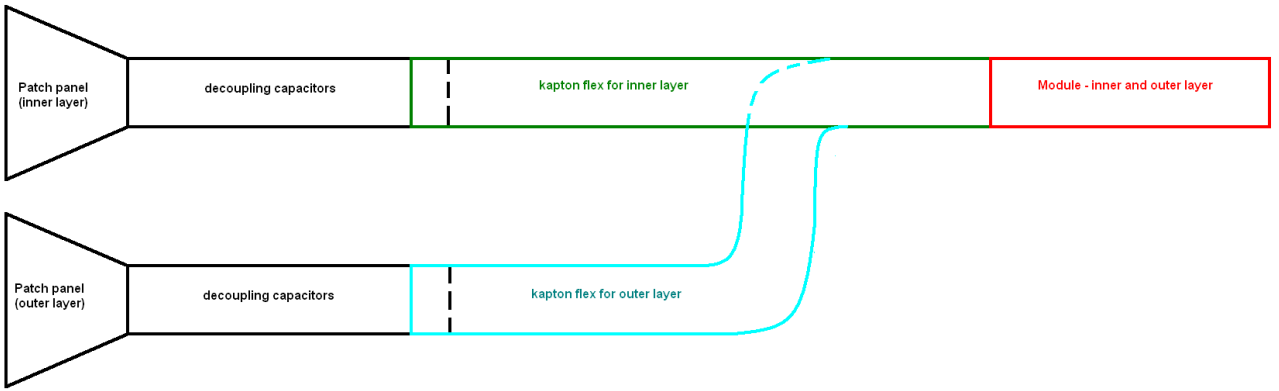
Other possibility:

5 patch panels arranged on a quater circle on two rows. The second row have a little offset to connect the patch panel to the kapton flex.



Connection PXD ↔ PP





Inner and outer layer of the PXD are nearly one upon the other, but on patch panel level there must be a side step to connect the power cables.

Three possibilities:

- Folding the flex (2x45°)
- Design a new flex variant with a bend
- Bend the flex from detector till the patch panel (mechanical stress!)

Flex prototype

A new flex prototype with the complete power and signal lines is in production, with

- 12 differential lines (JTAG, trigger and timing, fast data link signals)
- 20 power lines (power segmentation for Gate_On and CCG in each case 3 lines => protection from inhomogeneous radiation)
- 2 ground lines
- 8 sense lines with corresponding ground sense lines

=> altogether 62 lines

Top and bottom layer: power lines
Middle Layer: signal lines (differential lines + DCD Monitor line)
Problem: Not all differential lines can be covered with copper on top and bottom layer, as a matter of space!

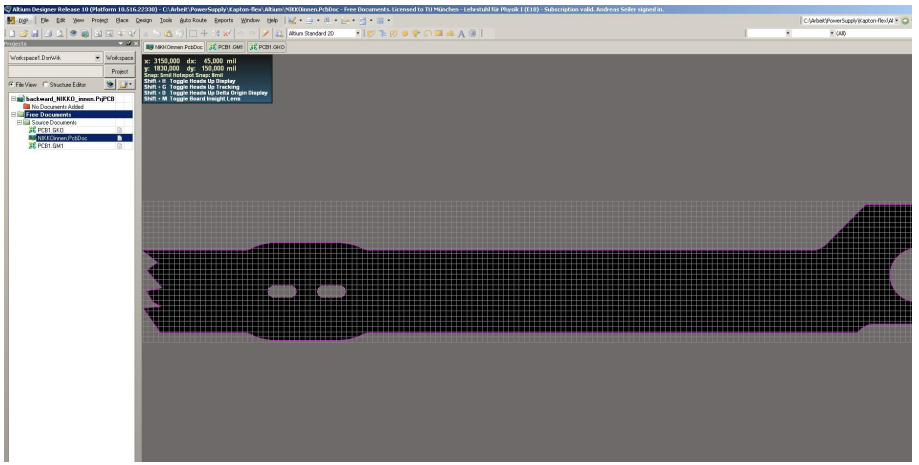
Five variants of flex prototype:
- different length: 300mm, 400mm and 500mm
- 400mm with screw hole at the front side where the flex can be bonded to the module
- 400mm reference flex (bottom and top layer are covered by copper, differential lines on the mid layer

Five of each are ordered; delivery date: around end of May 2011
Manufactor: Taiyo/Japan

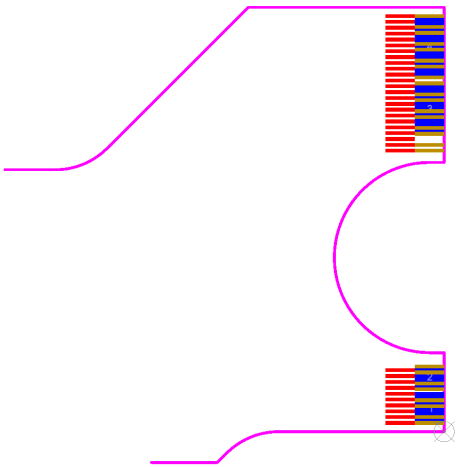
Import DXF Files in Altium

Since the end of April, we find a way how to change dxf files in Altium files.

Now, it is really comfortable to have an exchange of the files with the MPI.



With this conversion, we are much faster to bring the mechanical and electrical side together.



Next steps

- Test power distribution and signal integrity (Bonn) of the new flex prototype
- Design new flexes with the updated requirements (mechanical and electrical side)
- Define the brackets which hold the patch panels => new patch panel design

Thank you!