Very forward vertexing

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[1]DESY, Hamburg

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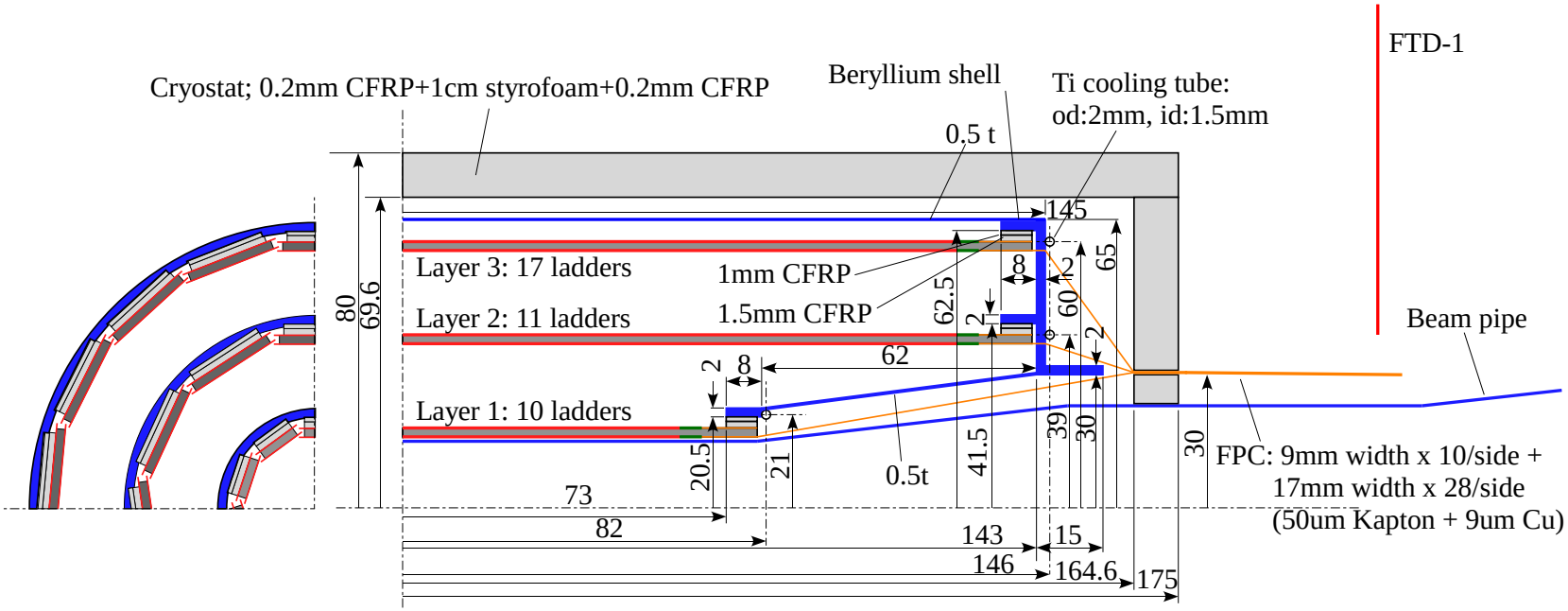
The Vertex Detector and the forward region



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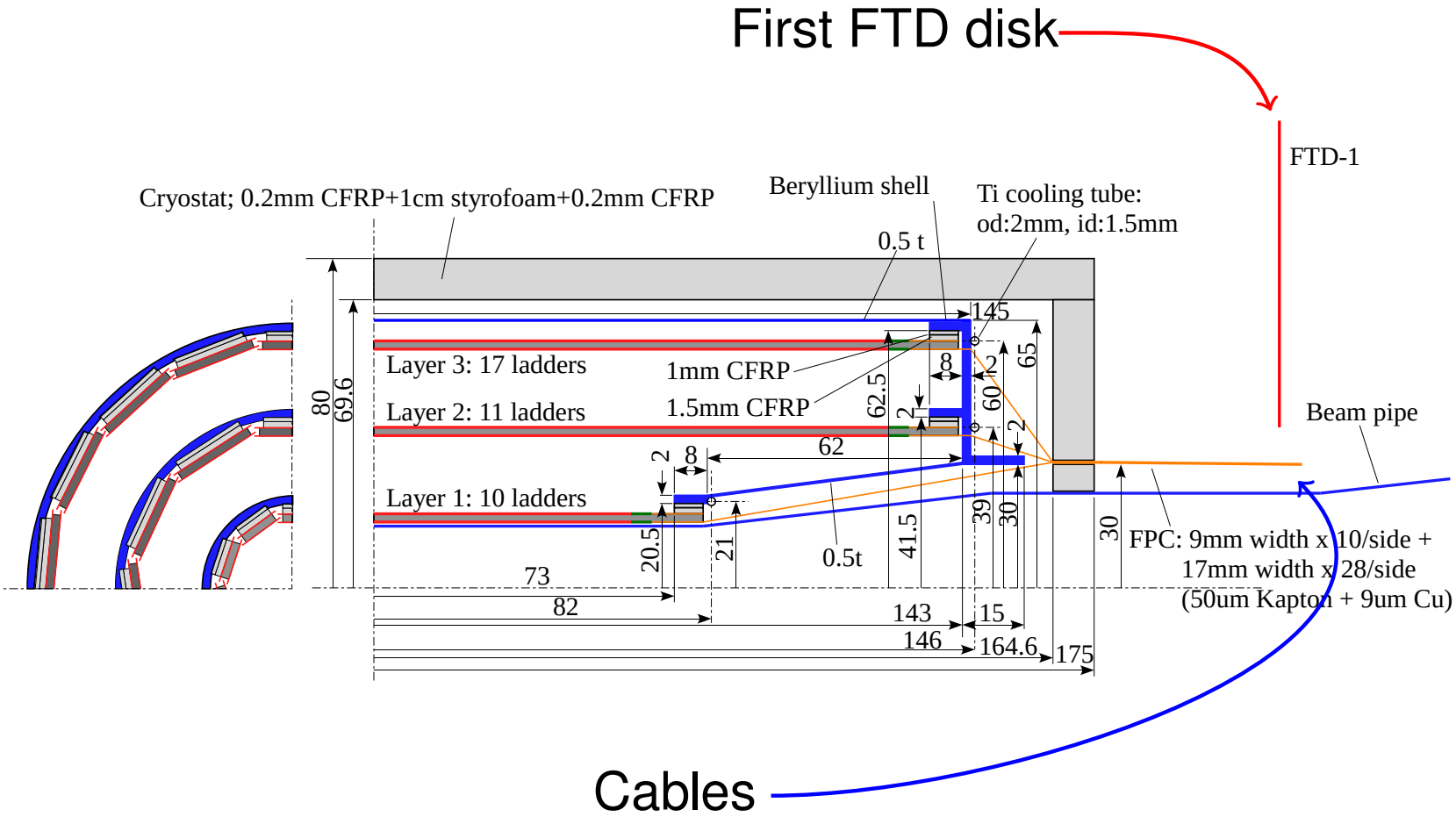

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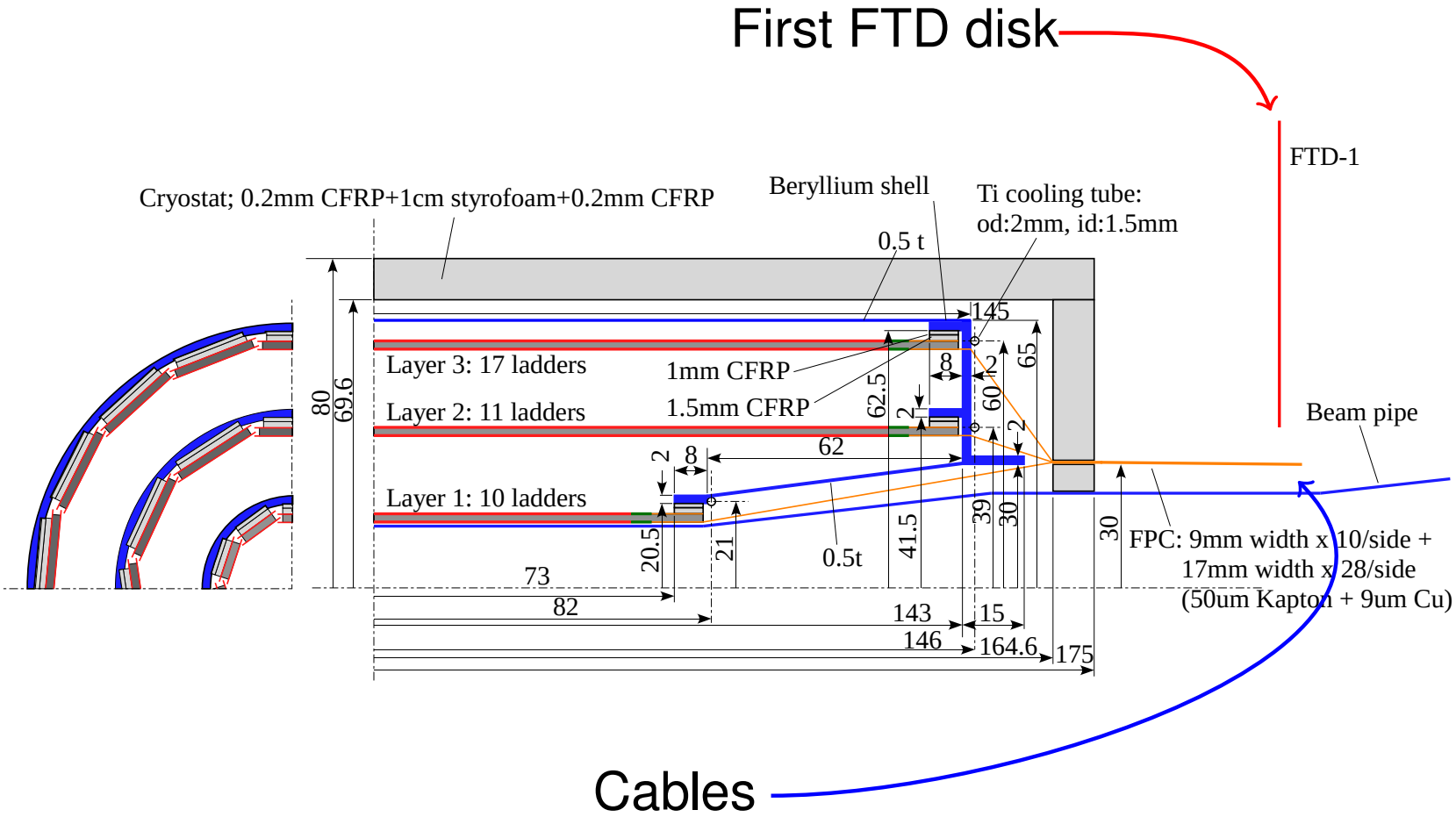

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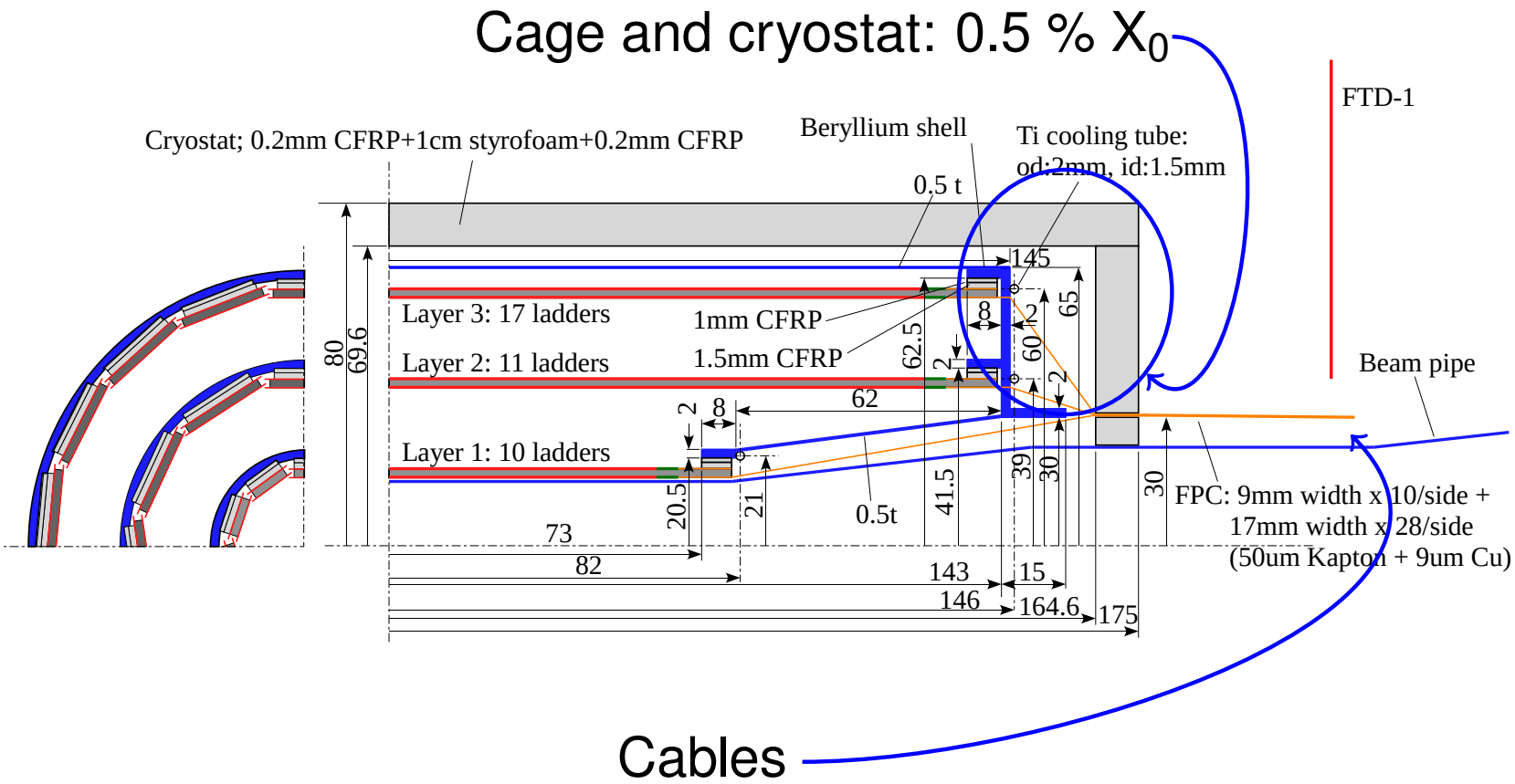
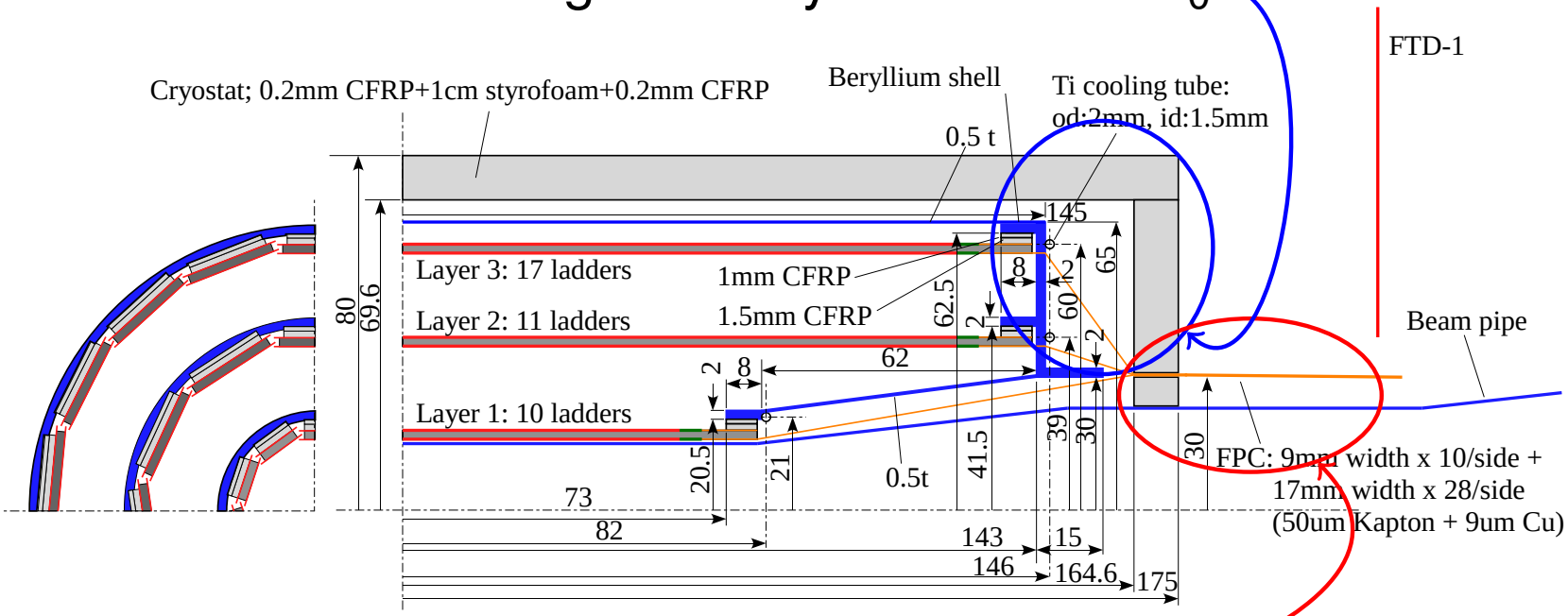


The Vertex Detector and the forward region

Cage and cryostat: 0.5 % X_0



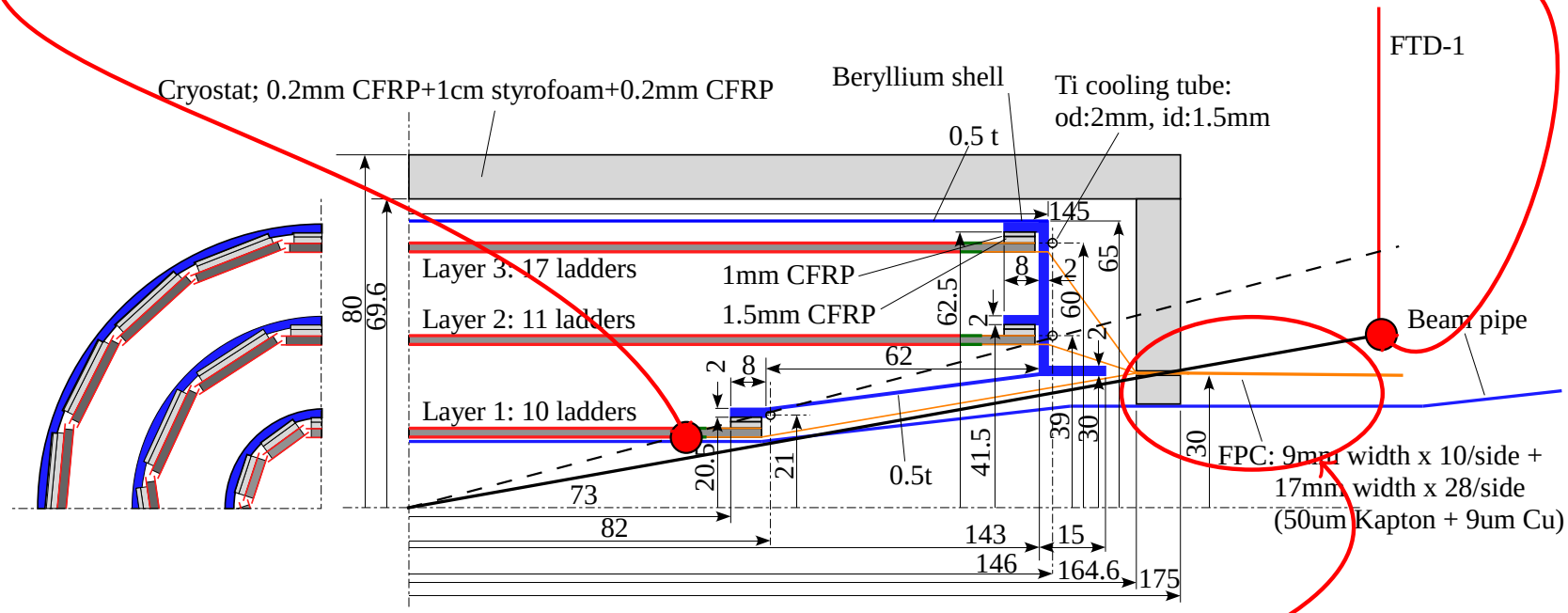
Cables

5% X_0 !!!

The Vertex Detector and the forward region

Hits VTX first: ∼ nothing in front

Hits FTD-1 first: lots in front



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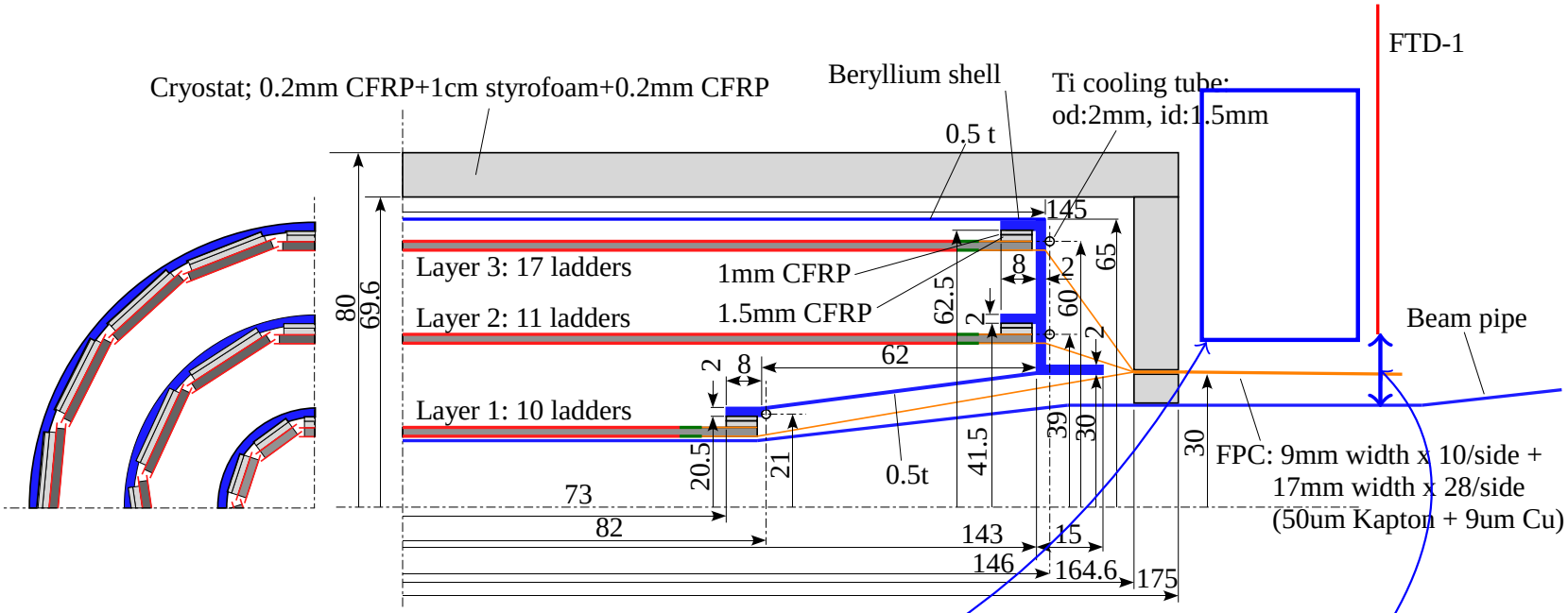

Nothing here !

Space needed for cables

Study effect of design on σ_{D0} @ low Θ with SGV

- Use SGV to calculate the covariance matrix in *scan* mode.
- Look at σ_{D0}, scanning in Θ.
- Fix p (not $p_\perp$!) to 2.5 GeV.
- Take geometry from the DBD text + cable estimates from C. Clerc.
- Then vary:
  - Cable routing from the VD (along beam-pipe or radially out)
  - FTD-1 position and inner radius.
  - Adding a "VTX-disk" inside the cryostat.
- A caveat: SGV can not handle cones, so the material-distribution is approximate : cones $\rightarrow$ combination of cylinders and planes covering the same angles.

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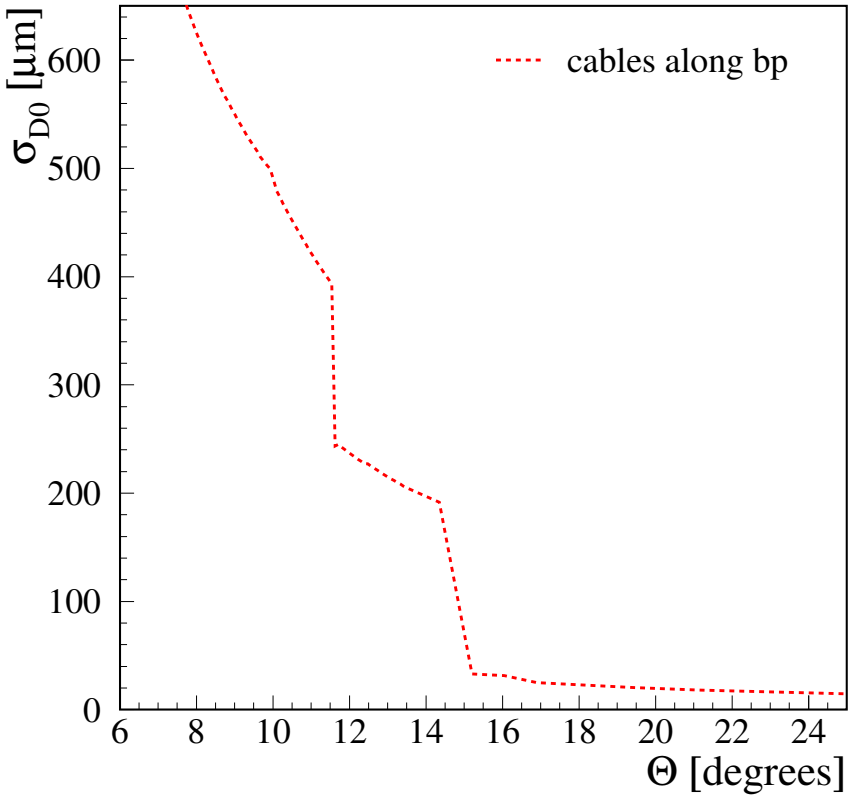
The effect on σ_{D0}

- σ_{D0} with cables *along the beam-pipe*
- ... and routed outside FTD-1 & FTD-2
- Also move FTD-1 closer (in z and R)
- ... or add a pixel-disc *inside the cryostat*, with point-res 2.8 μm
- All together (routing, closer FTD1, pixel disc)



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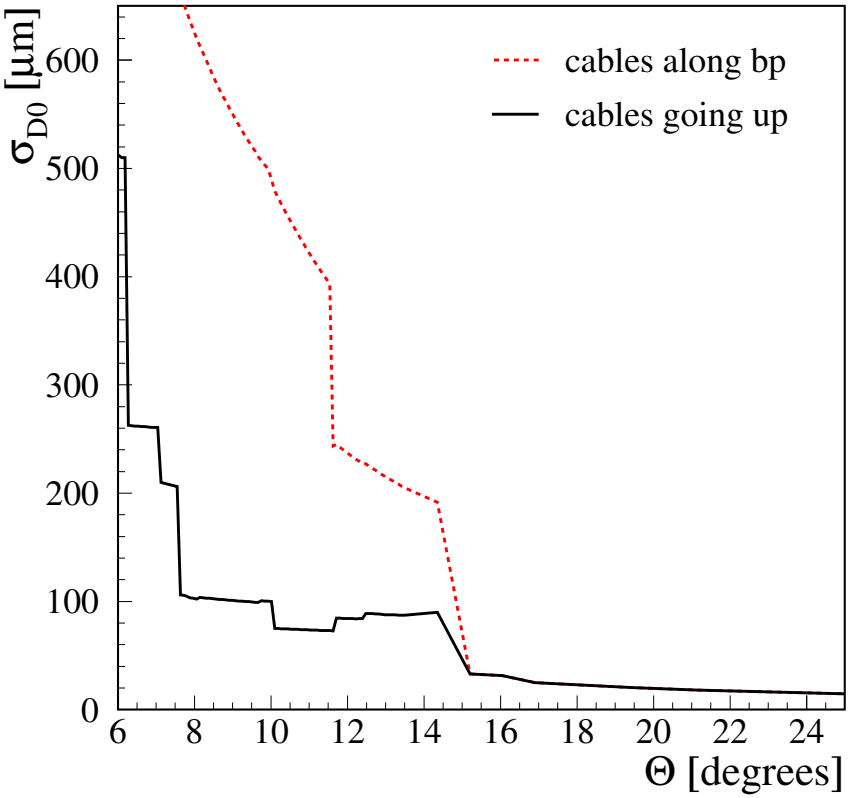

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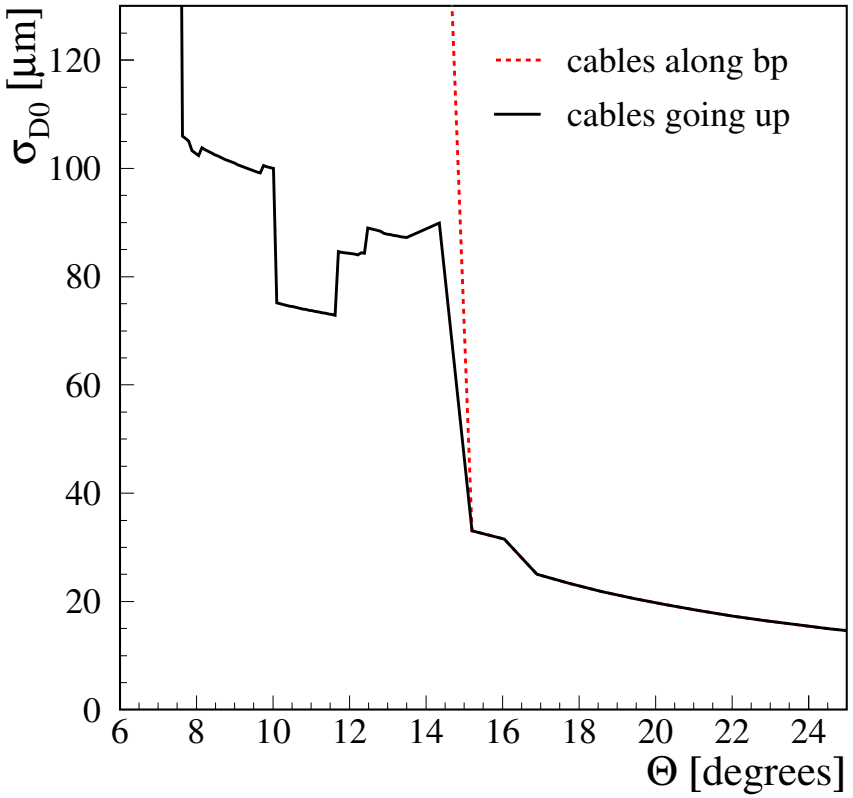

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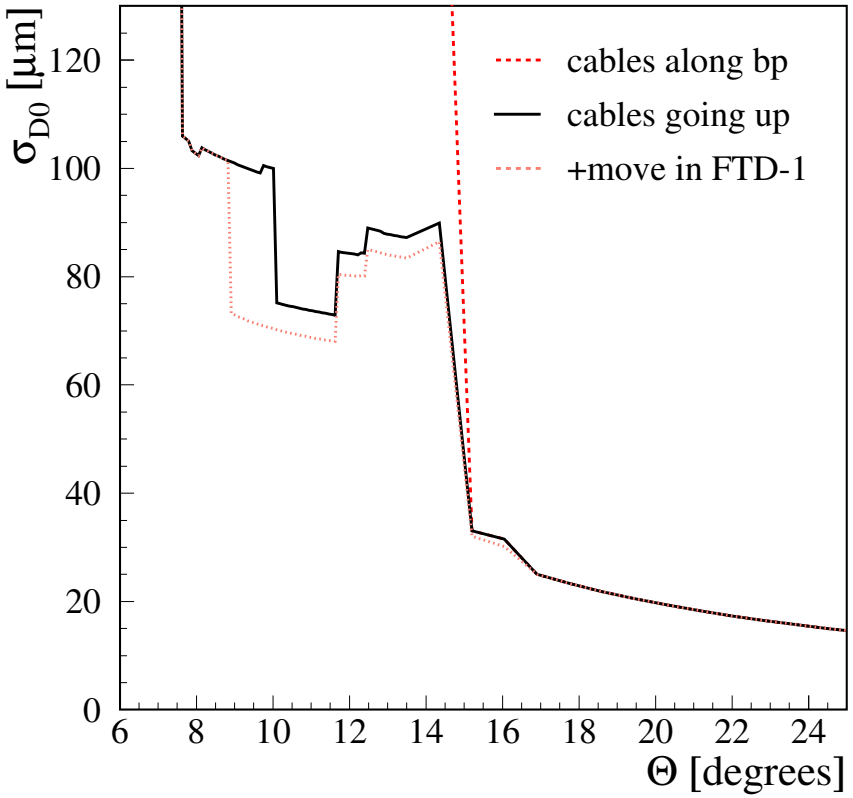

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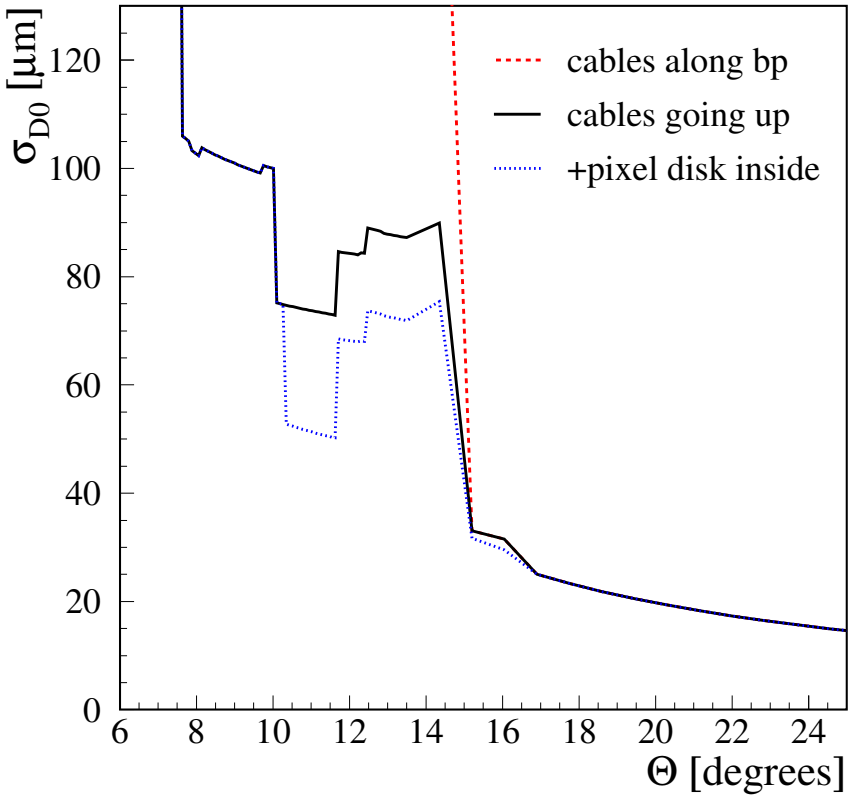

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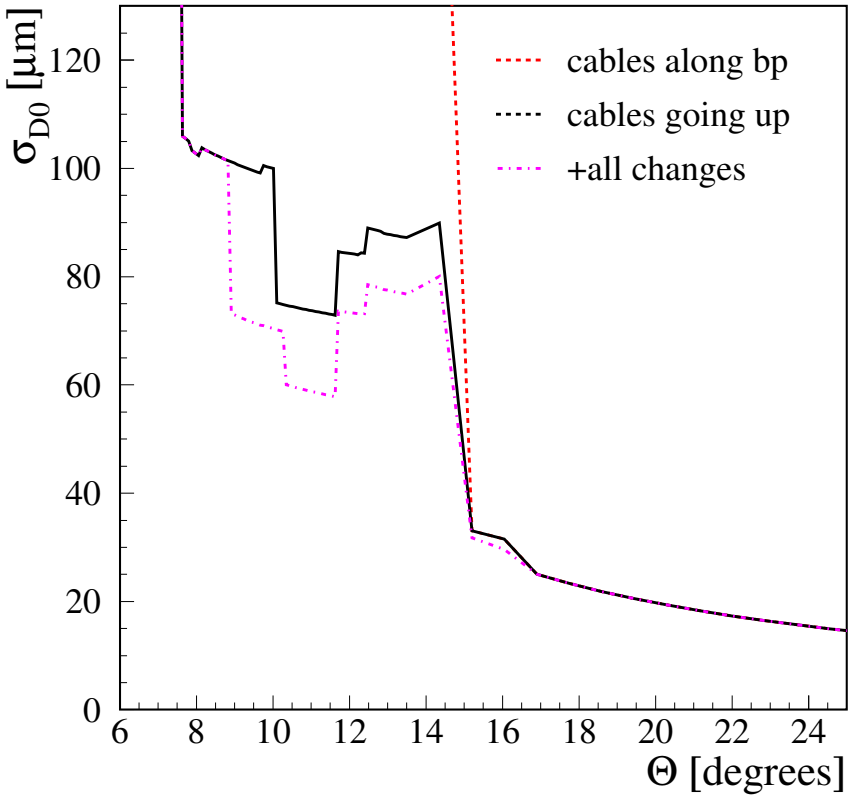

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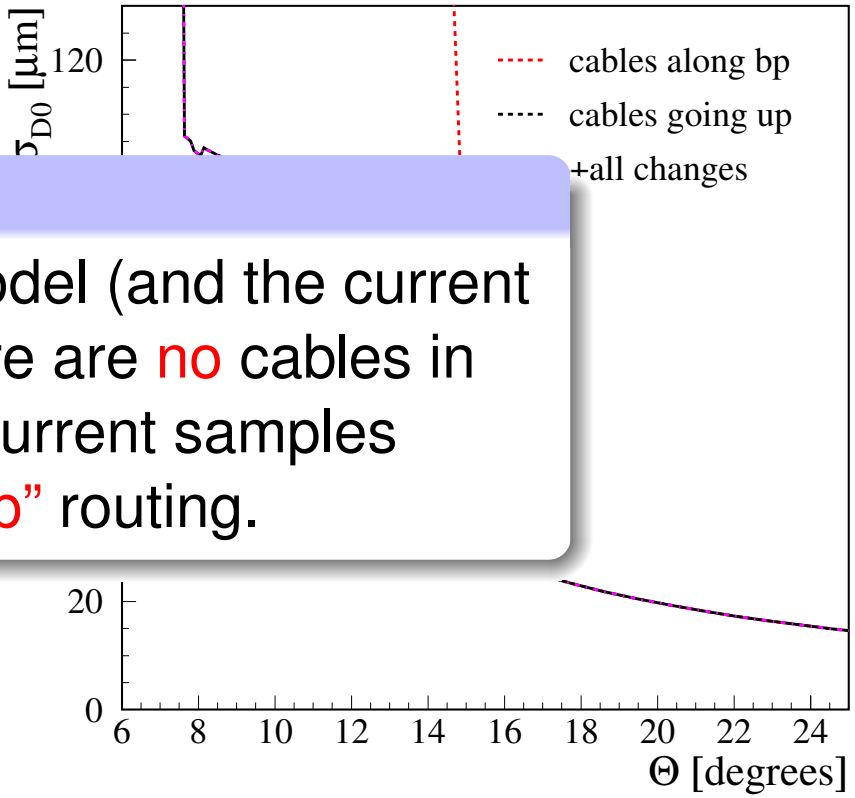

Note:

In the DBD Mokka model (and the current DD4HEP model), there are no cables in the critical region ⇒ current samples corresponds to the "up" routing.

Conclusions: non-alternative facts

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From now on:

it's *"silicon" first*