

Integrated design of central barrel and forward disk trackers

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Some thoughts

Start making barrel module prototypes in 2005

Need to know how barrel looks like first
(minimize number of different module types!)

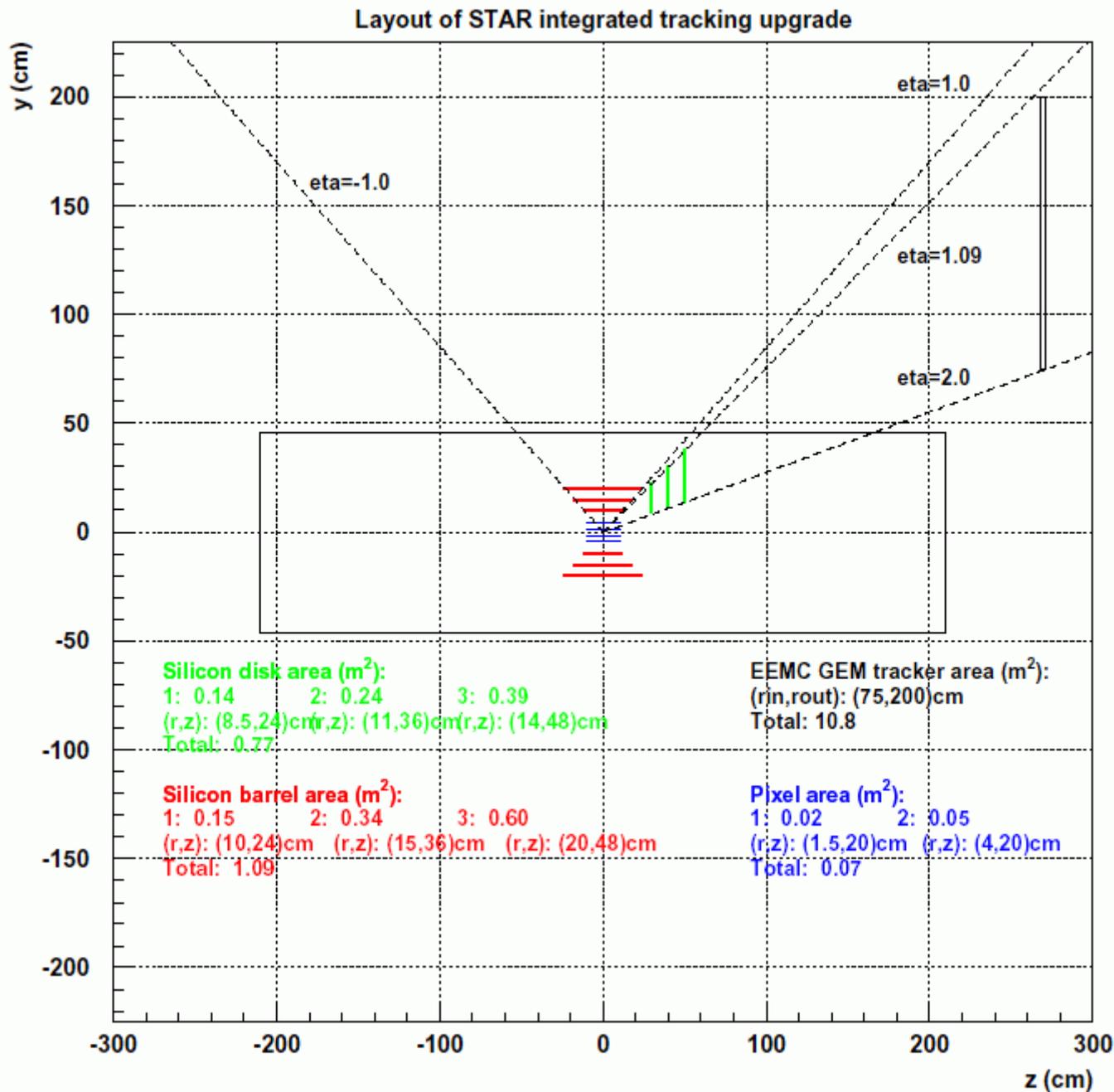
Barrel: $-1 < \eta < +1$

Disks: $+1 < \eta < +2$

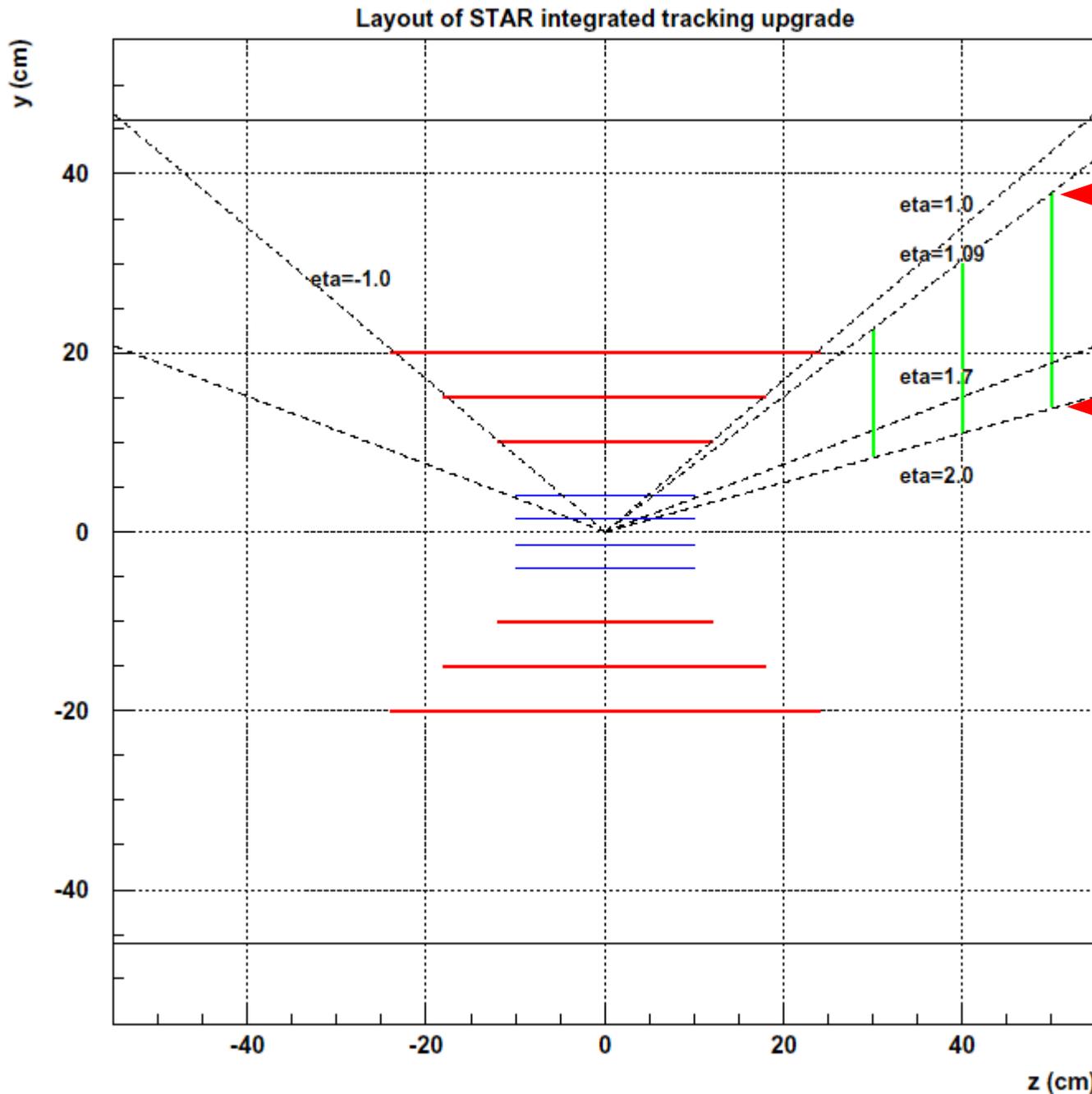
This makes the Barrel rather small and the Disks
really big

Can we come up with a more integrated design?

The 'current' 'design'



The 'current' 'design'



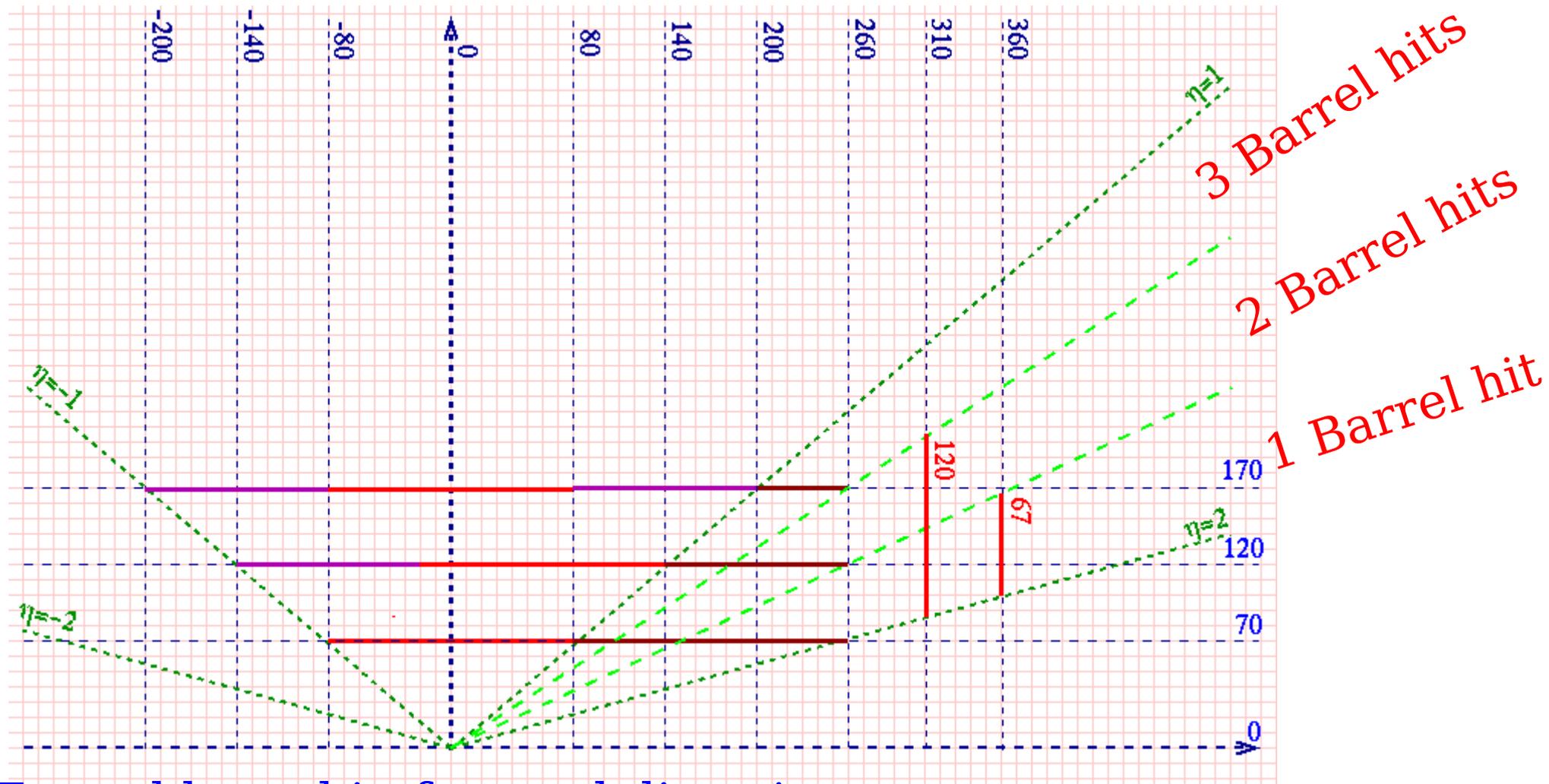
Disks are getting pretty big

And pretty long modules!

Length of modules exceeds maximum striplength (15cm) imposed by APV25 chip

Awkward Disks design

A 'better' design'



Extend barrel in forward direction

- > Forward hits from barrel
- > Disks will get much smaller
- > Disk module lengths within 15cm constraint

What are the possible caveats?

The barrel is getting about 40% bigger
(447 ---> 613 silicon sensors)

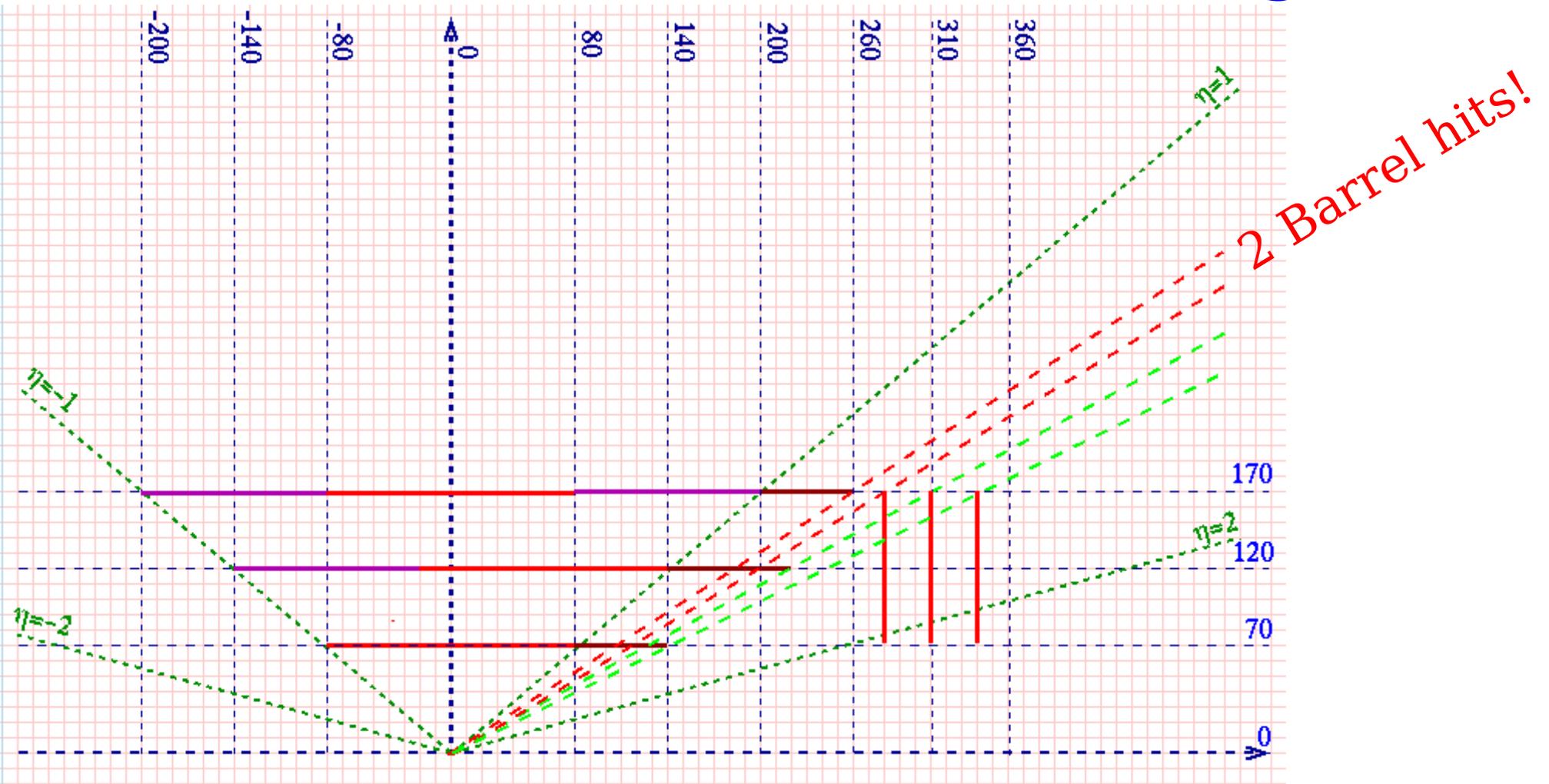
Staged implementation of forward part (i.e. the forward barrel modules) more complicated

Shallow angles lead to long ionization paths

--> up to 1.2 mm in 300 μm thick sensors

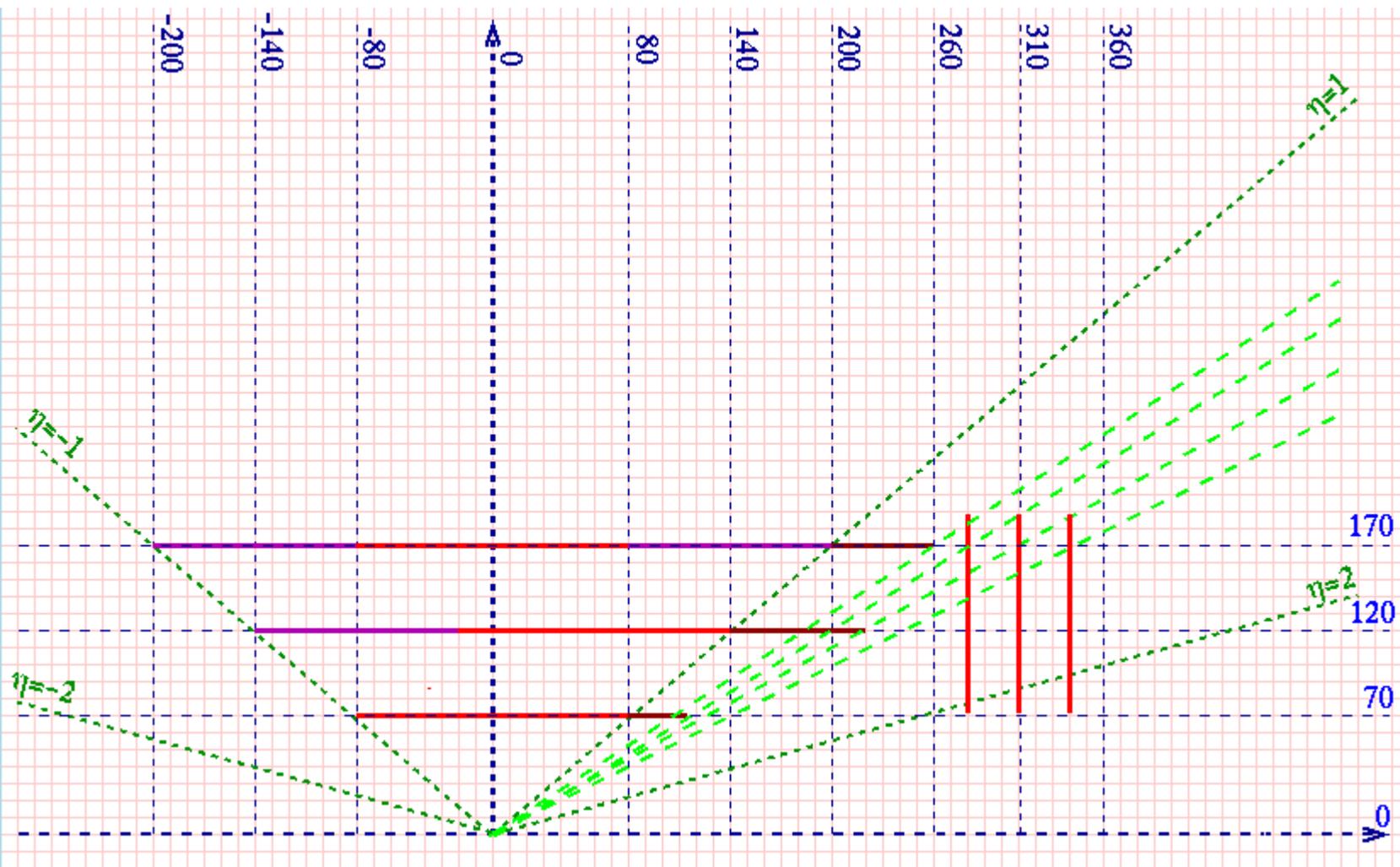
- Note that strips are running parallel to beam axis and resolution with small stereo angles will be about 0.8 mm in z direction
- Disk sensors will have 0.8 mm in tangential direction
- Does the new design lead to an acceptable pointing resolution in forward direction?

A more standard design



Barrel layers 1 and 2 can be shorter
3 Standard size disks with 10cm long modules

Optimizing the design



3 Identical Disks will be a bit bigger with 12cm long modules
Barrel can again be made slightly shorter
3 Barrel and/or Disk hits for $+1 < \eta < +2$