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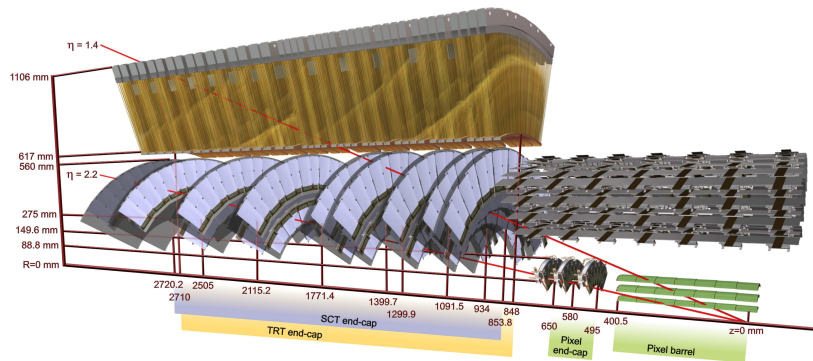
# **Detector Layout**

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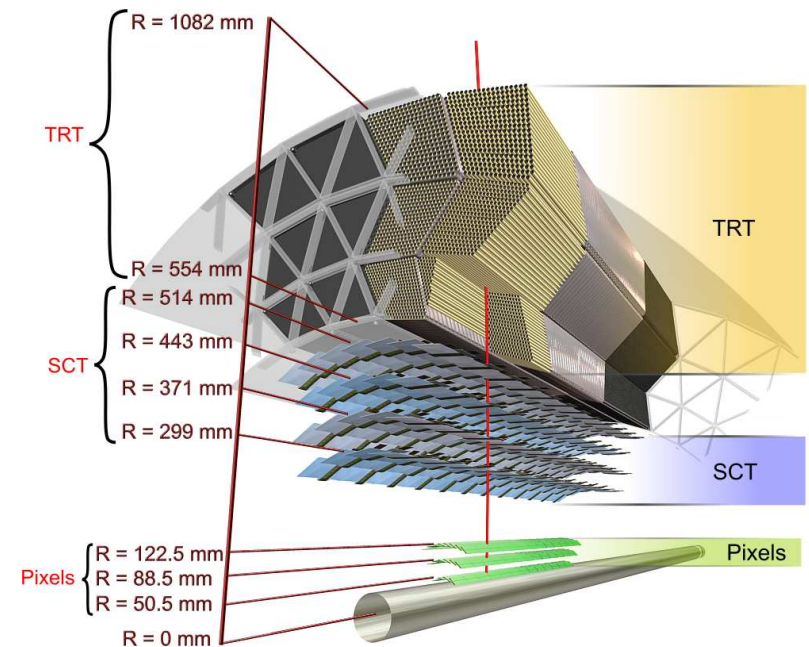
# Detector layout overview

## Detector layout (1)

<http://iopscience.iop.org/1748-0221/3/08/S08003>  
(JINST Paper)



**Figure 4.3:** Drawing showing the sensors and structural elements traversed by two charged tracks of 10 GeV  $p_T$  in the end-cap inner detector ( $\eta = 1.4$  and  $2.2$ ). The end-cap track at  $\eta = 1.4$  traverses successively the beryllium beam-pipe, the three cylindrical silicon-pixel layers with individual sensor elements of  $50 \times 400 \mu\text{m}^2$ , four of the disks with double layers (one radial and one with a stereo angle of 40 mrad) of end-cap silicon-microstrip sensors (SCT) of pitch  $\sim 80 \mu\text{m}$ , and approximately 40 straws of 4 mm diameter contained in the end-cap transition radiation tracker wheels. In contrast, the end-cap track at  $\eta = 2.2$  traverses successively the beryllium beam-pipe, only the first of the cylindrical silicon-pixel layers, two end-cap pixel disks and the last four disks of the end-cap SCT. The coverage of the end-cap TRT does not extend beyond  $|\eta| = 2$ .

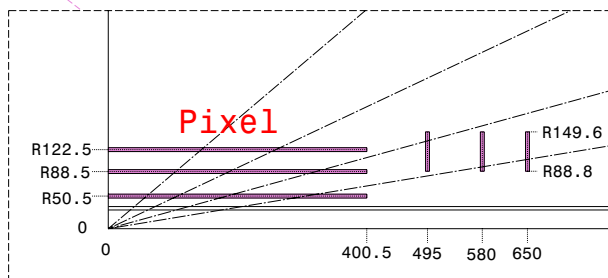
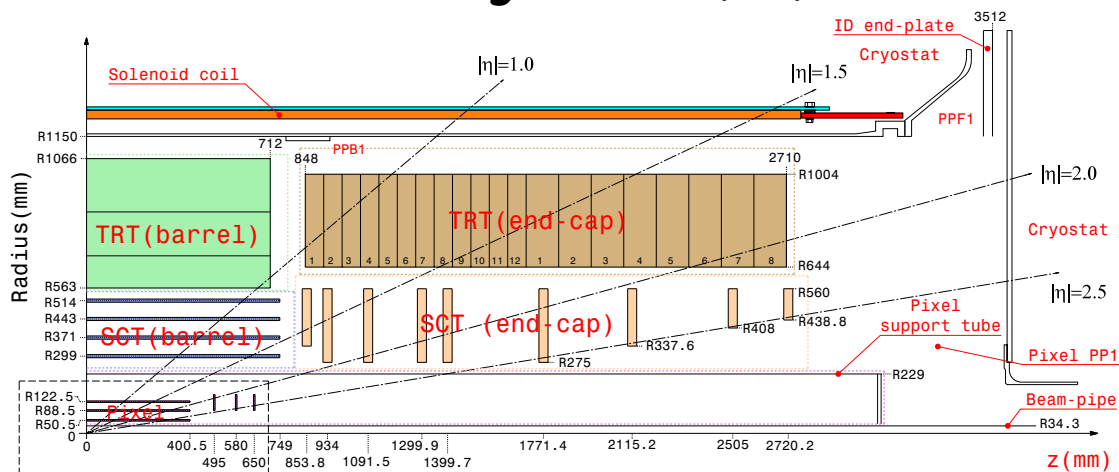


**Figure 4.2:** Drawing showing the sensors and structural elements traversed by a charged track of 10 GeV  $p_T$  in the barrel inner detector ( $\eta = 0.3$ ). The track traverses successively the beryllium beam-pipe, the three cylindrical silicon-pixel layers with individual sensor elements of  $50 \times 400 \mu\text{m}^2$ , the four cylindrical double layers (one axial and one with a stereo angle of 40 mrad) of barrel silicon-microstrip sensors (SCT) of pitch  $80 \mu\text{m}$ , and approximately 36 axial straws of 4 mm diameter contained in the barrel transition-radiation tracker modules within their support structure.

# Detector layout overview

## Detector layout (2) z-R view

<http://iopscience.iop.org/1748-0221/3/08/S08003>  
(JINST Paper)



### Envelopes

Pixel	45.5 < R < 242 mm   Z   < 3092 mm
SCT barrel	255 < R < 549 mm   Z   < 805 mm
SCT end-cap	251 < R < 610 mm 810 <   Z   < 2797 mm
TRT barrel	554 < R < 1082 mm   Z   < 780 mm
TRT end-cap	617 < R < 1106 mm 827 <   Z   < 2744 mm

**Figure 4.1:** Plan view of a quarter-section of the ATLAS inner detector showing each of the major detector elements with its active dimensions and envelopes. The labels PP1, PPB1 and PPF1 indicate the patch-panels for the ID services.

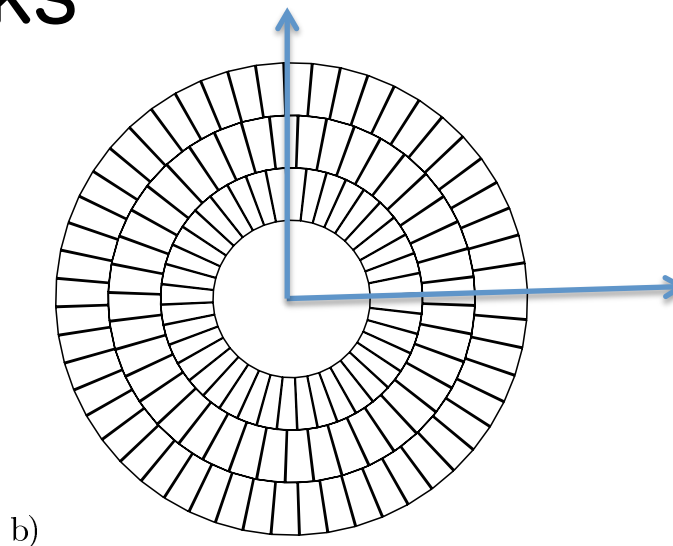
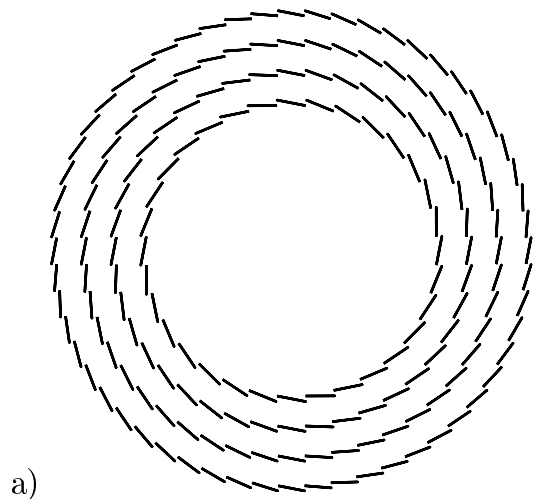
# Divisions for phi

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SCT ( $\phi$  division)

(a) Barrel layers

(b) Endcap disks



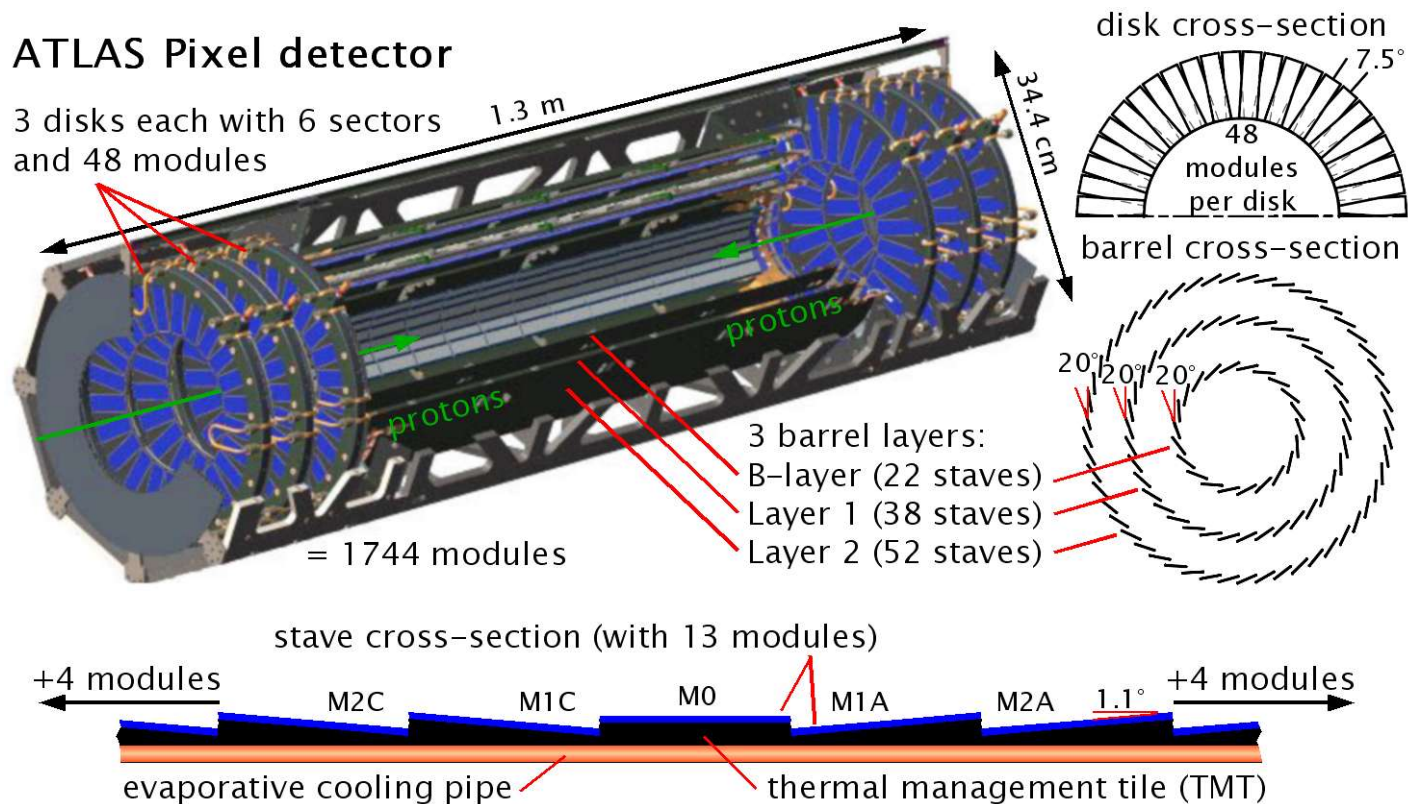
[http://www.hep.phy.cam.ac.uk/~atlasdaq/FilesForWikiDownload/bjg\\_thesis.pdf](http://www.hep.phy.cam.ac.uk/~atlasdaq/FilesForWikiDownload/bjg_thesis.pdf) (Figure 3.1)

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# Division for phi

## Pixel ( $\phi$ division)

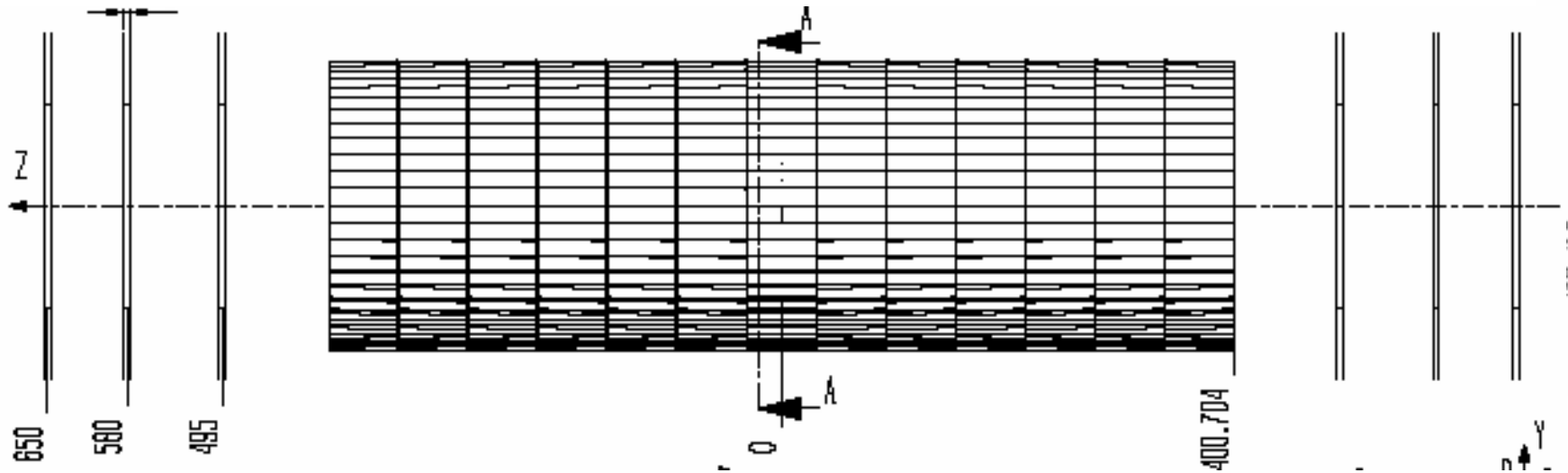
<http://cdsweb.cern.ch/record/1016933> (Figure4-1)



# Division for eta

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Pixel



# From JINST paper

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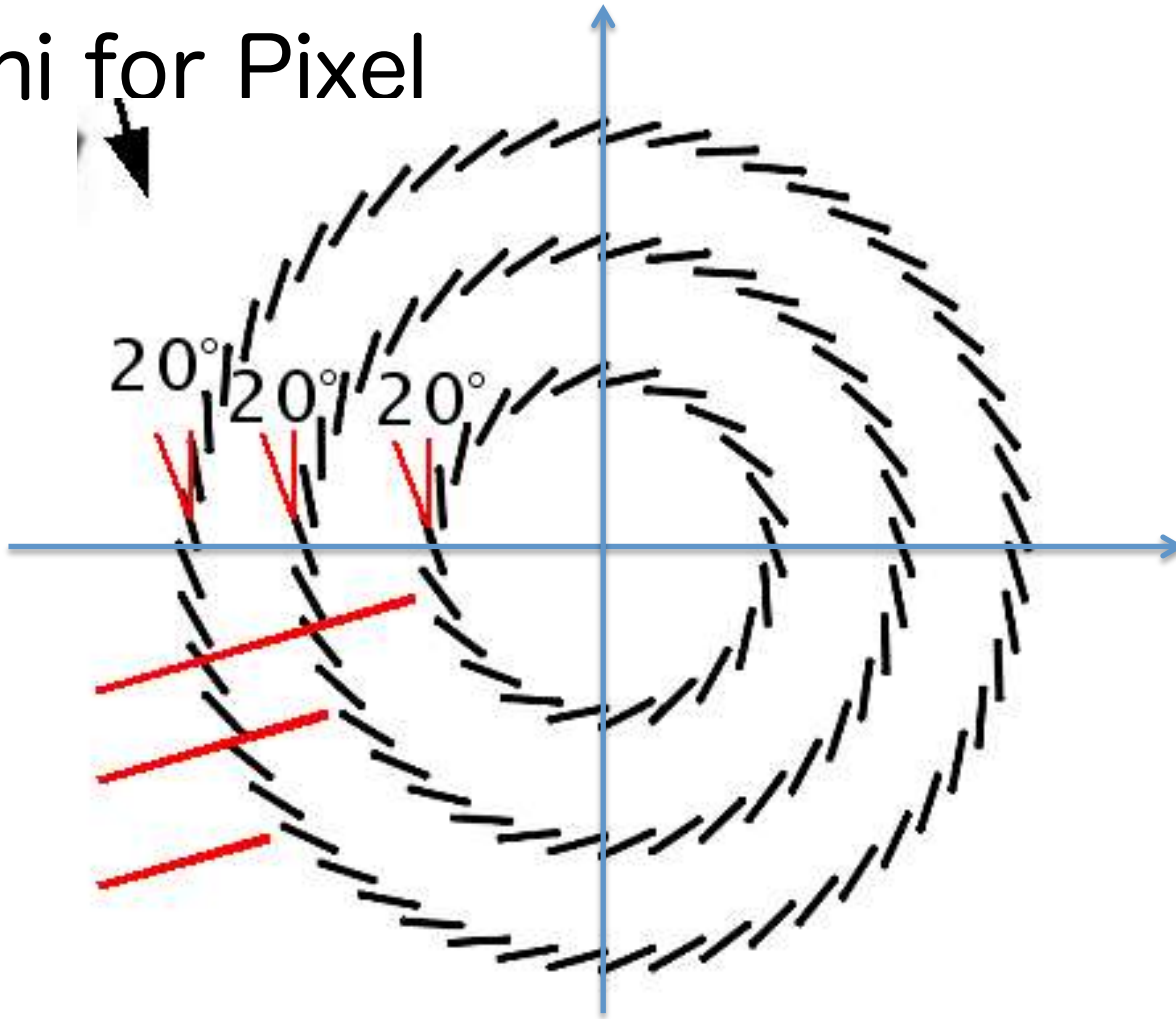
## Number of pixel modules

<b>Barrel</b>	<b>Radius (mm)</b>	<b>Staves</b>	<b>Modules</b>	<b>Pixels</b>
Layer-0	50.5	22	286	$13.2 \times 10^6$
Layer-1	88.5	38	494	$22.8 \times 10^6$
Layer-2	122.5	52	676	$31.2 \times 10^6$
<b>End-cap (one side)</b>	<b><math>z</math> (mm)</b>	<b>Sectors</b>	<b>Modules</b>	<b>Pixels</b>
Disk 1	495	8	48	$2.2 \times 10^6$
Disk 2	580	8	48	$2.2 \times 10^6$
Disk 3	650	8	48	$2.2 \times 10^6$
<b>Barrel and both end-caps</b>			1744	$80.4 \times 10^6$

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Phi for Pixel



20° 20° 20°