11.9 Material Compilation

This Section lists all the material forseen in the SCT up to the end of the inner wall of the cryostat. For the purposes of clarity the material is split into two types; that which is the form of cylinders, for which the radiation lengths given in Table 11-39 are calculated normal to the cylinder surface; and that which is planar, “disk shaped”, for which radiation lengths given in Table 11-40 are calculated normal to the plane, along the beam direction.

Table 11-39 lists the material in cylindrical form.

Table 11-40 lists the material in planar form. In Table 11-40 where the material thins as the radius increases, the radiation length given is that at the mean radius. The radiation length given for the forward modules is the average radiation length for the modules on each wheel.

Figure 11-99 shows the material in the SCT as a function of η, using data taken from Table 11-39 and Table 11-40.

Table 11-39 Cylindrical material

ITEM	Mean R	Z min.	Z max.	X_0 (%)
Barrel 3 carbon fibre cylinder	275	0	790	0.265
Barrel 3 module mountings, cooling, etc.	285	0	790	0.386
Barrel 3 modules	300	0	790	1.298
Barrel 3 power tapes	285	0	790	0.130
Barrel 3 power connectors	285	0	790	0.070
Barrel 3 opto hybrids and fibres	285	0	790	0.023
Barrel 3 cooling manifold	290	769	790	1.380
Barrel 4 carbon fibre cylinder	349	0	790	0.265
Barrel 4 module mountings, cooling, etc.	359	0	790	0.386
Barrel 4 modules	373	0	790	1.306
Barrel 4 power tapes	359	0	790	0.130
Barrel 4 power connectors	359	0	790	0.070
Barrel 4 opto hybrids and fibres	359	0	790	0.023
Barrel 4 cooling manifold	364	769	790	1.640
Barrel 5 carbon fibre cylinder	422	0	790	0.265
Barrel 5 module mountings, cooling, etc.	432	0	790	0.386
Barrel 5 modules	447	0	790	1.309
Barrel 5 power tapes	432	0	790	0.130
Barrel 5 power connectors	432	0	790	0.070
Barrel 5 opto hybrids and fibres	432	0	790	0.023

Table 11-39 Cylindrical material

ITEM	Mean R	Z min.	Z max.	X_0 (%)
Barrel 5 cooling manifold	438	769	790	2.220
Barrel 6 carbon fibre cylinder	495	0	790	0.305
Barrel 6 module mountings, cooling, etc.	505	0	790	0.433
Barrel 6 modules	520	0	790	1.313
Barrel 6 power tapes	505	0	790	0.130
Barrel 6 power connectors	505	0	790	0.070
Barrel 6 opto hybrids and fibres	505	0	790	0.023
Barrel 6 cooling manifold	512	769	790	2.54
Barrel region active insulation	539	0	822	0.496
Barrel patch panel	1150	790	890	5.600
Forward space frame, module 1	575	853	1178	0.309
Forward space frame, module 2	575	1178	1589	0.268
Forward space frame, module 3	575	1589	2343	0.273
Forward space frame, module 4	575	2343	2830	0.294
Forward cabling services	600	830	1280	0.11
Forward cooling services	600	830	1280	0.067
Forward cabling services	600	1280	2810	0.120
Forward cooling services	600	1280	2810	0.072
Forward region active cooling	610	822	2825	0.496
Forward cabling services	1150	1280	2810	0.178
Forward cooling services	1150	1280	2810	0.581
Forward cabling services	1150	2810	3405	0.360
Forward cooling services	1150	2810	3405	1.176
Barrel cabling services	1150	815	3405	0.856
Barrel cooling services	1150	815	3405	0.976

Table 11-40 Planar material

ITEM	Mean Z	R min.	R max.	X_0 (%)
Barrel 3 carbon fibre cylinder end flange	780	255	280	0.900
Barrel 4 carbon fibre cylinder end flange	780	323	353	0.900
Barrel 5 carbon fibre cylinder end flange	780	387	427	0.900
Barrel 6 carbon fibre cylinder end flange	780	460	500	0.900
Interlink wheel	788	245	530	0.498
Barrel 3 cabling services	815	285	550	0.210
Barrel 3 cooling services	815	290	550	0.044
Barrel 4 cabling services	815	359	550	0.242
Barrel 4 cooling services	815	364	550	0.048
Barrel 5 cabling services	815	438	550	0.060
Barrel 5 cooling services	815	432	550	0.408
Barrel 6 cabling services	815	505	550	0.291
Barrel 6 cooling services	815	512	550	0.064
All barrels cabling services	815	550	1150	0.568
All barrels cooling services	815	550	1150	0.220
Forward wheel 1	835	260	560	0.898
Forward wheel 1 modules	835	260	560	1.529
Forward wheel 1 cabling services	835	260	560	0.170
Forward wheel 2	925	336	560	0.912
Forward wheel 2 modules	925	336	560	1.402
Forward wheel 2 cabling services	925	336	560	0.140
Forward wheel 3	1072	260	560	0.898
Forward wheel 3 modules	1072	260	560	1.529
Forward wheel 3 cabling services	1072	260	560	0.170
Forward wheel 4	1260	260	560	0.898
Forward wheel 4 modules	1260	260	560	1.529
Forward wheel 4 cabling services	1260	260	560	0.170
Forward cabling services	1280	570	1150	0.288
Forward cooling services	1280	570	1150	0.736
Forward wheel 5	1460	260	560	0.898
Forward wheel 5 modules	1460	260	560	1.529

Table 11-40 Planar material

ITEM	Mean Z	R min.	R max.	X_0 (%)
Forward wheel 5 cabling services	1460	260	560	0.170
Forward wheel 6	1695	260	560	0.898
Forward wheel 6 modules	1695	260	560	1.529
Forward wheel 6 cabling services	1695	260	560	0.170
Forward wheel 7	2135	336	560	0.912
Forward wheel 7 modules	2135	336	560	1.402
Forward wheel 7 cabling services	2135	336	560	0.140
Forward wheel 8	2528	401	560	0.992
Forward wheel 8 modules	2528	401	560	1.596
Forward wheel 8 cabling services	2528	401	560	0.180
Forward wheel 9	2776	439	560	0.833
Forward wheel 9 modules	2776	439	560	1.397
Forward wheel 9 cabling services	2776	439	560	0.150
Forward cabling services	2810	570	1150	0.243
Forward cooling services	2810	570	1150	0.752
Active cooling end plate	2825	30	585	0.532

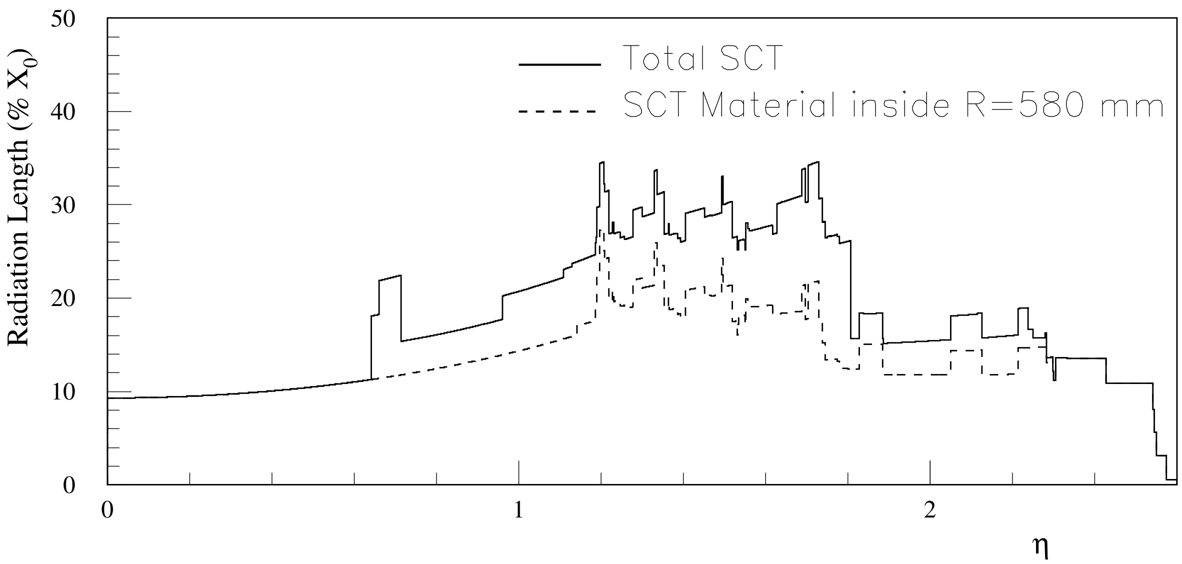

Figure 11-99 Material in the SCT as a function of η. The data have been taken from Table 11-39 and Table 11-40.