L2 Tracking Preprocessor

by
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This note outlines a design for a L2 tracking preprocessor first presented in an upgrade trigger meeting on March 14, 1996. The purpose of this preprocessor is to match the AxCFT tracks with the U/V information to form 3 dimension tracks. These tracks could then be used by a global processor to match to Z information from other detectors or to form invariant masses.

The first problem which must be confronted in matching an axial fiber hit to either the U or the V fiber hits is the large number of U and V fibers that cross any one Axial fiber. Table 1 shows these numbers. Each axial fiber in the innermost A and B layers is crossed by 61 U and 61 V fibers. Each axial fiber in all of the other layers is crossed by 94 fibers. When this number of fibers for each layer is divided by the number of fibers in a sector per layer we get the number of sectors shown in the last column. The number of sectors is 3 or 4.

Figure 1 shows the case for layer A and the axial and U fibers. The rectangle labeled home represents the 32 axial fibers based in the sector. U fibers from 4 sectors cross these axial fibers; one of the sectors is the home U sector and the other 3 are the neigbors from one side.

An additional sector of U fibers on either side must be added to accommodate the low Pt tracks. The axial trigger is anchored in the outermost or H layer. A track that is near the sector edge on the H layer may fall into the next

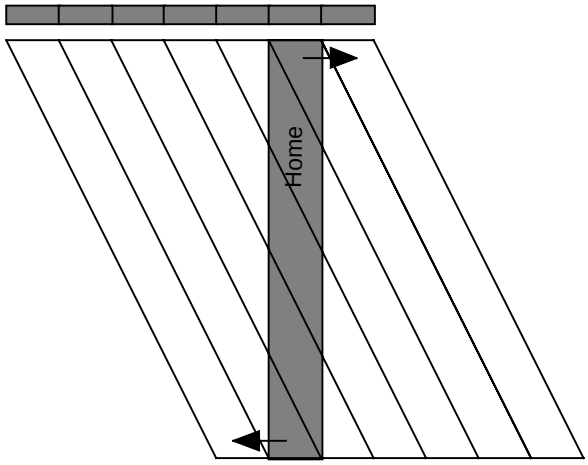
sector in the A layer. Thus the track in the A layer may lay outside the axial home fibers.

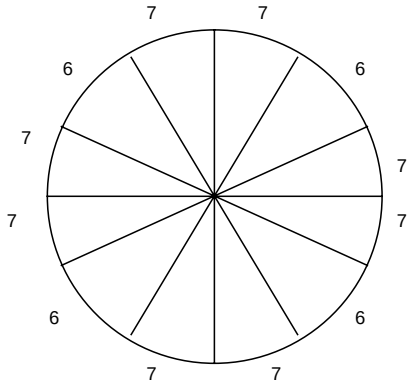
Layer	Stereo Angle			Stereo Offset		
	rad/cm	rad	deg	cm	fibers	sectors
A	0.00000000	0.00000000	0.000	0.000	0.0	0.0
A-U	0.00176671	0.03474589	1.991	5.768	60.3	3.8
A-V	0.00175200	0.03474917	1.991	5.768	60.3	3.8
B	0.00000000	0.00000000	0.000	0.000	0.0	0.0
C	0.00000000	0.00000000	0.000	0.000	0.0	0.0
C-U	0.00121819	0.03442483	1.972	8.675	94.4	3.9
C-V	0.00121118	0.03442900	1.973	8.676	94.4	3.9
D	0.00000000	0.00000000	0.000	0.000	0.0	0.0
E	0.00000000	0.00000000	0.000	0.000	0.0	0.0
E-U	0.00091497	0.03442392	1.972	8.675	94.4	2.9
E-V	0.00091101	0.03442707	1.973	8.676	94.4	2.9
F	0.00000000	0.00000000	0.000	0.000	0.0	0.0
G	0.00000000	0.00000000	0.000	0.000	0.0	0.0
G-U	0.00073261	0.03583708	2.053	9.031	94.3	2.4
G-V	0.00073007	0.03583476	2.053	9.030	94.3	2.4
H	0.00000000	0.00000000	0.000	0.000	0.0	0.0
PS			20	113.21	22.6	1.6

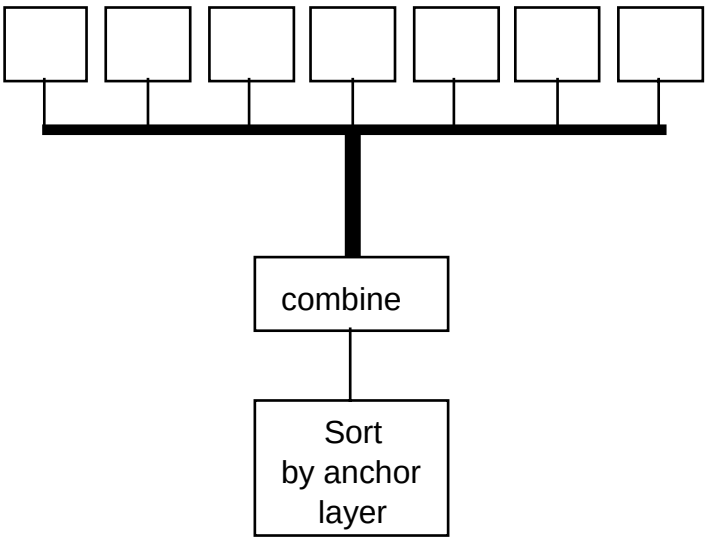
When these extra two sectors are added in we see that 6 sectors of U fibers are need to match with each axial sector. Stated in a different way if the track matching were done for each of the 80 L1-CFT sectors information from 6 other sectors would need to be imported. And each of the U sector's data would have to be sent to 6 different axial sectors. If we into super-sectors of at least 6 sectors wide then data would only need to be shared with one neighbor super-sector. For this reason form the 80 L1-CFT sectors into 12 L2-CFT sectors as shown in figure 2.

When the trigger framework issues an L1 accept the axial front ends digitize and start their readout to the L3. This readout is over optical fiber. We can place an optical splitter on each of there optical channels and also receive the information in a L2 preprocessor.

The L1-CFT axial trigger information is also available and can be transmitted to the L2 preprocessor. This information is received in the L2-CFT sectors and is used as a filter on the data.



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