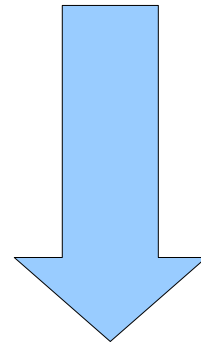
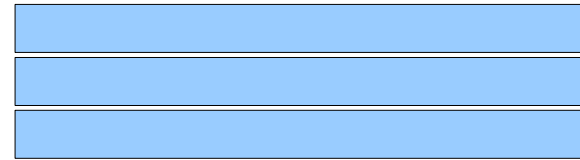


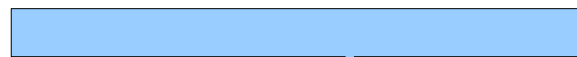
# 1/2-SS shifted architecture

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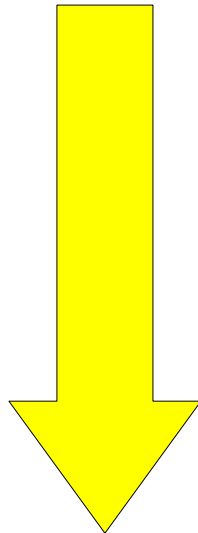
# Strategy



Default-SS roads come into yellow AM and simultaneously compared with all **yellow** roads



AM comparison:  
 $ss1=ss2$  or  $ss1=ss2+1$



Pre-fill found ss-shifted roads



...

On-the-fly AM with all found SS-shifted roads

Max # matches is a parameter

For this normal road, 2 matches found in ss-shifted roads.  
**For each match**, send the list of overlapping hits into track fitter. Effectively, track fitter gets two roads with very little combinatorics in each.

# Run description

- 2.2M pattgen banks, full eta
- 100 (or 500) events of Whbb @  $10^{34}$
- Cross-sector RW on, overlap RW off
- Standard chi2 cuts
- Truth association via GEANT
- Efficiency denominator: *fiducial truth*
  - Only primary event (pileup tracks are ignored)
  - Pt > 1 GeV
  - |Eta| < 2.5

# Results

# matches	Total eff	$\Delta$	Muon eff	$\Delta$	# Kfits	(factor)
1	39.83%	29.17%	59.50%	24.50%	NA	NA
3	51.80%	17.20%	75.00%	9.00%	NA	NA
5	54.70%	14.30%	75.90%	8.10%	NA	NA
<b>10</b>	<b>63.78%</b>	<b>5.22%</b>	<b>77.80%</b>	<b>6.20%</b>	<b>461</b>	<b>10.27</b>
default	69.00%	0.00%	84.00%	0.00%	4734	1

**X10 reduction in # of fits at the cost of a 5% - 6% drop in efficiency**

It seems that the primary cause for the efficiency drop is **low coverage of the banks**. With this method, we get hit twice by this low coverage (~66%):

- We may not find a road in normal bank
- We may not find a matching road in SS-shifted bank

# Variation in per-bank reduction in # of fits

#fits (default case)	SS-shifted(10 matches)	Reduction in #fits	Bank #
4,828,780	385,991	12.51	1
4,497,855	412,132	10.91	2
3,549,508	361,272	9.83	3
3,443,478	354,469	9.71	4
4,672,198	476,431	9.81	5
5,469,136	453,070	12.07	6
4,314,075	438,979	9.83	7
3,061,312	341,664	8.96	8
	Avg reduction	10.45	

# Summary

- Confirms results from old simulation
- Much cleaner and easier to run
- Plug-in architecture via *hit\_filter* executable:
  - (Optionally) runs on output of road mergers
  - Creates “modified”merged roads
  - Feeds directly into track fitter
- Not fully committed to SVN yet:
  - Needs some performance tuning (CPU time)