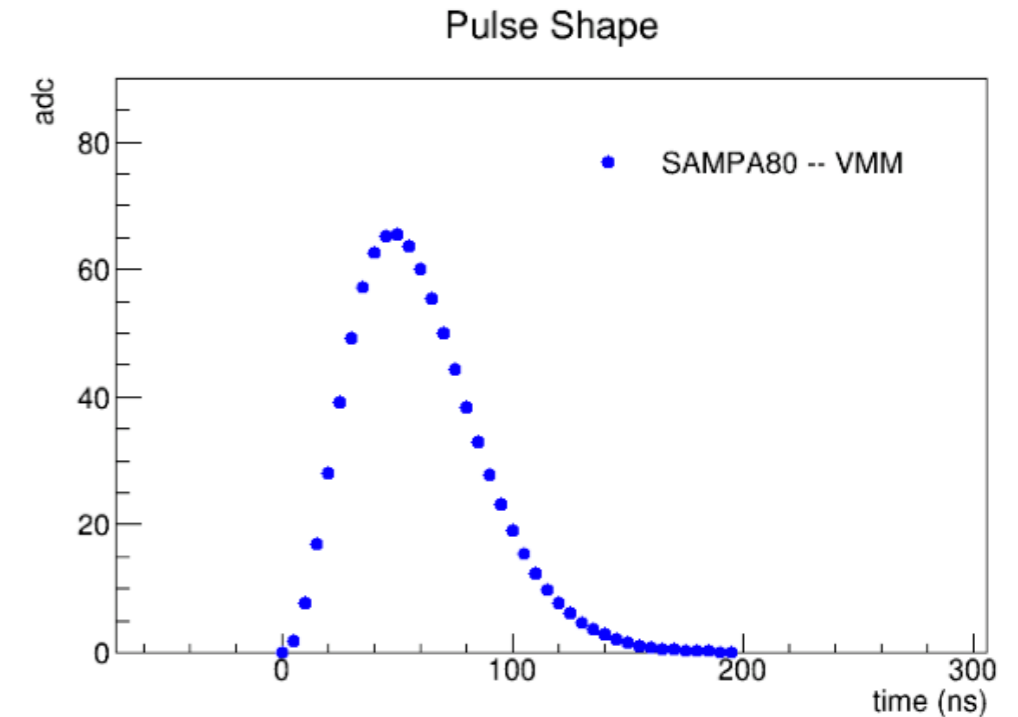
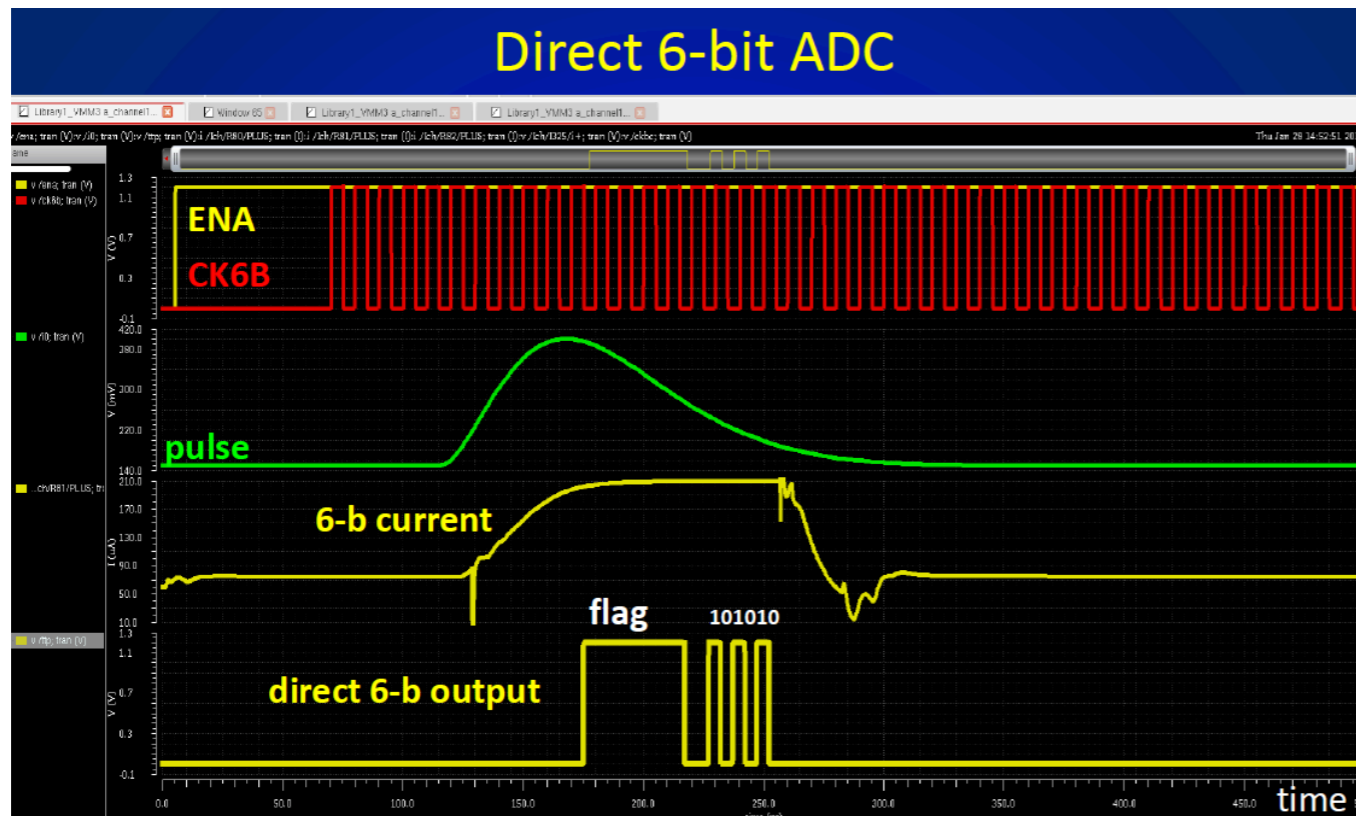


# VMM Simulation

Jinlong Zhang  
June 11, 2019

# VMM pulse shape



Nilanga:

So (taking the signal start time to be  $t=0$ )

1. if background come at  $t < 0$ ; channel is reset with the trigger, so the background pulse is not recorded.
2. if background comes during the ramp up of the signal ( $0 < t < 50$  ns); background is mixed with the signal, could lead to corrupted data, worse resolution, but not completely lost.
3. if background comes later ( $50$  ns  $< t$ ); channel is busy processing and recording the signal hit. So the background pulse is ignored.

\* Ideal case, no trigger jitter, no noise, etc.

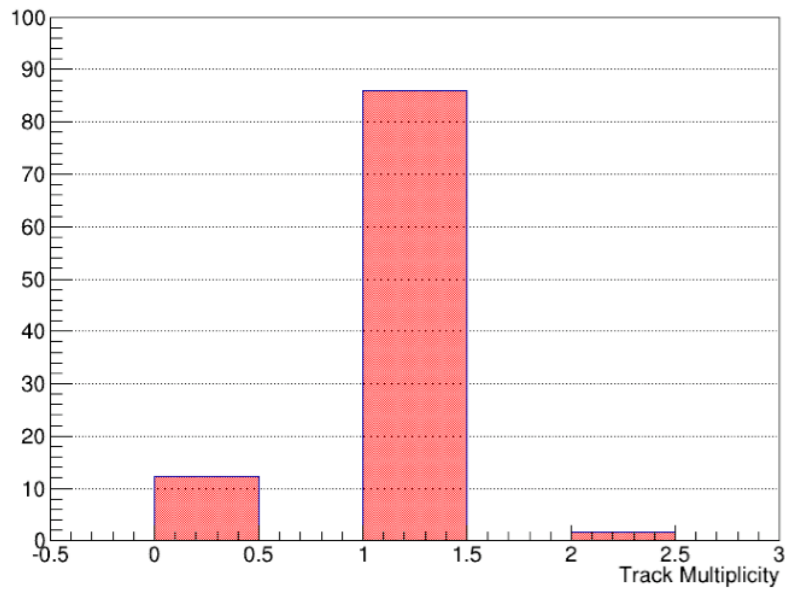
# Occupancy

	APV25	VMM - Toy1	<b>VMM-Nilanga</b>
1	16.7%	4.5%	<b>2.2%</b>
2	9.0%	2.3%	<b>1.1%</b>
3	7.7%	2.0%	<b>1.0%</b>
4	2.8%	0.8%	<b>0.4%</b>
5	2.6%	0.7%	<b>0.4%</b>

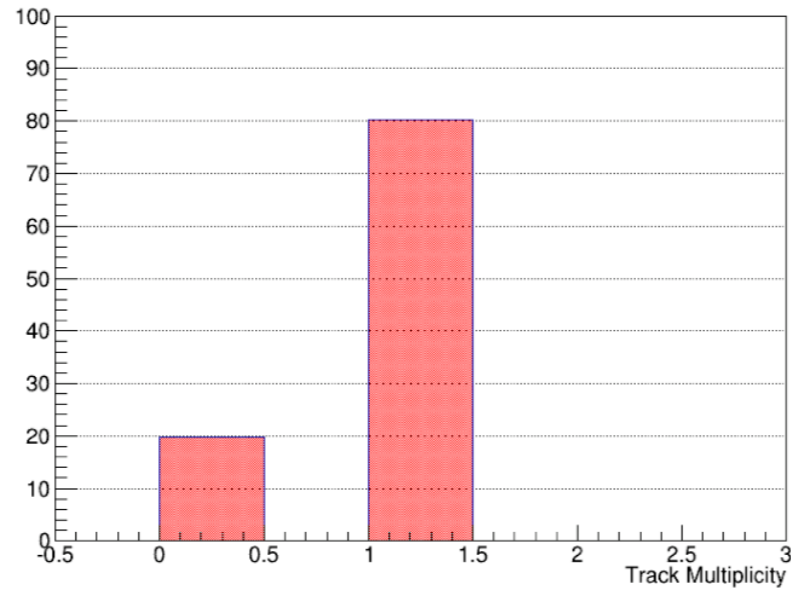
- VMM: Significantly lower occupancy ratio (# of hit strip / # of total strip)

# Efficiency comparison

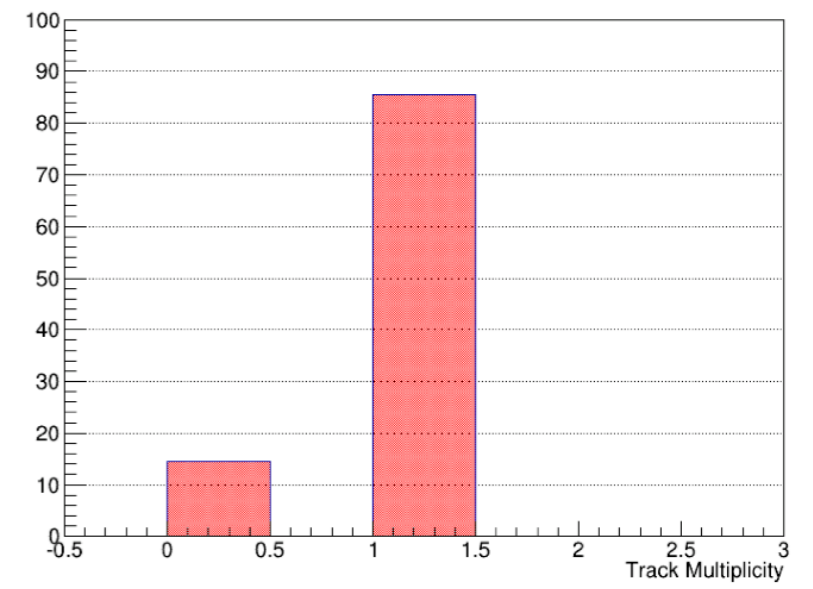
APV25  
Efficiency



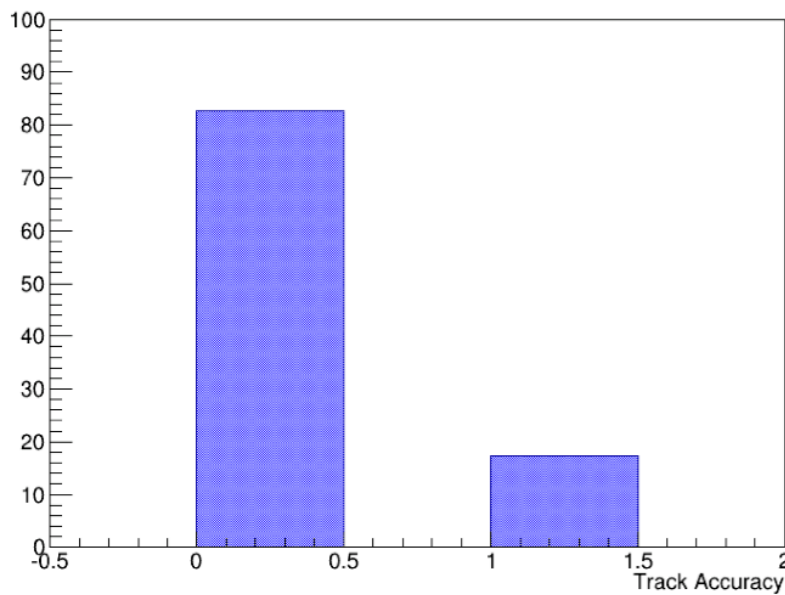
Toy 1  
Efficiency



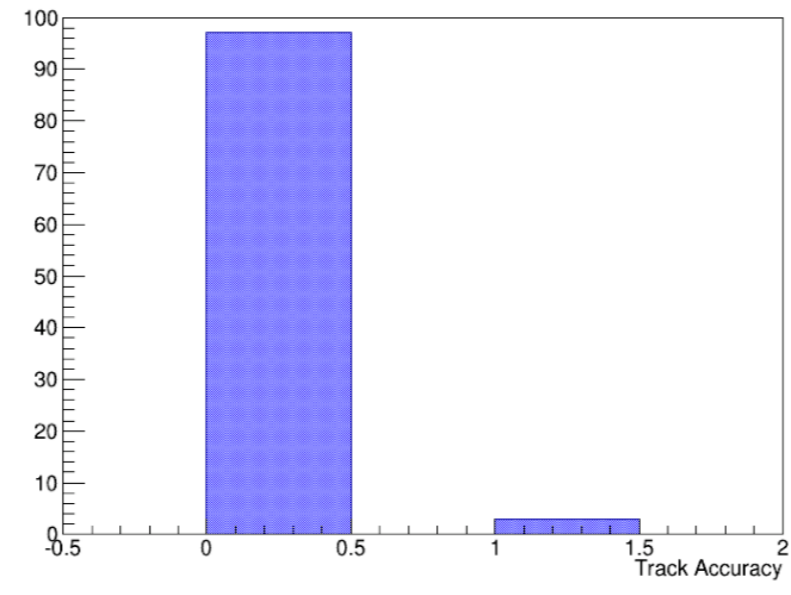
Nilanga  
Efficiency



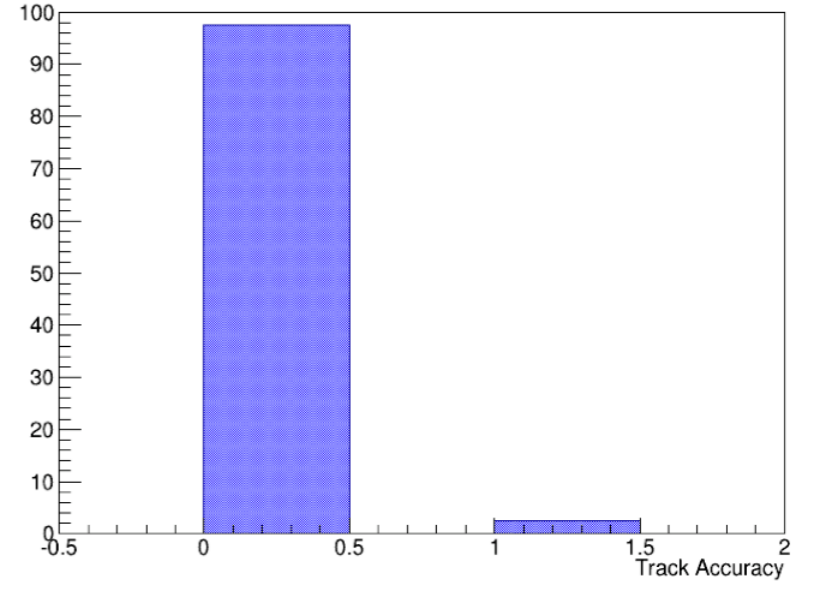
Accuracy



Accuracy



Accuracy



Very high occupancy

Dead time was assumed

Bkgd only contribute in shaping time