

# Efficiency in BCAL

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## Efficiency Study Over Mod7/Mod8 Runs

- ▶ Studying the efficiency of BCAL in Mod7/8 runs and  $\phi$  modulation of efficiency.

|                  |      |      |      |      |
|------------------|------|------|------|------|
| Run #            | 2931 | 3179 | 3079 | 3182 |
| Mod              | 7    | 7    | 8    | 8    |
| Beam Current     | 70   | 63   | 38   | 8    |
| Beam Energy      | 5.5  | 5.5  | 5.5  | 5.5  |
| Solenoid Current | 800  | 1300 | 1200 | 1300 |

- ▶ Cuts Considered:
  - FCAL Shower: Only consider events that contain FCAL showers.
  - Forward Showers: Only Consider BCAL showers with  $Z > 260$  cm.

## Efficiency Algorithm (Slide copied from Mark Dalton)

- Find track and match to BCAL shower
  - Calculate efficiency on layer basis
- if layer 2 has a hit in that cluster then layer 1 must have a hit in that cluster
- Do this on a module-by-module basis
  - Add in hits missing from clustering algorithm (Enhanced Efficiency)

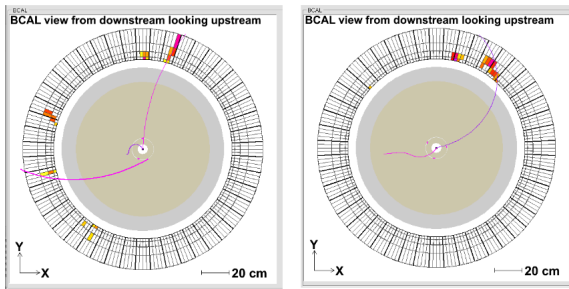


Figure: Cluster efficiency per layer (Event examples from run 1506)

No cut red ○, FCAL shower cut blue □  
(Ignoring error bars).

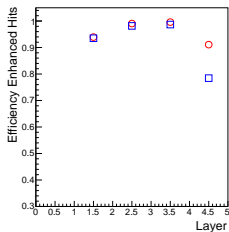
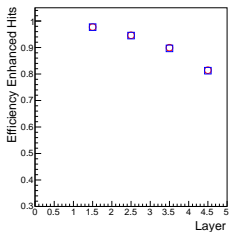
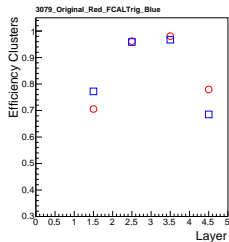
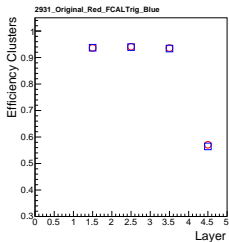


Figure: Left: Run 2931 Mod 7, Right: Run 3079 Mod 8.

No cut red  $\circ$  , FCAL shower cut blue  $\square$   
(Ignoring error bars).

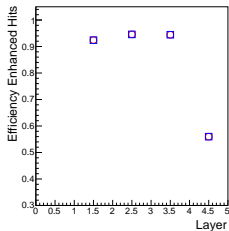
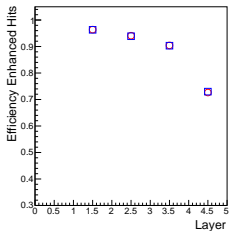
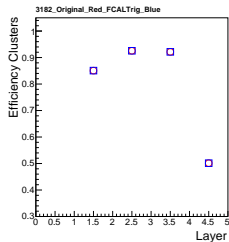
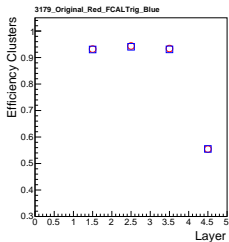


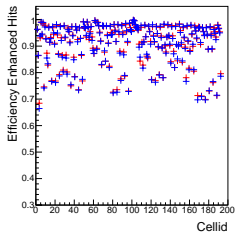
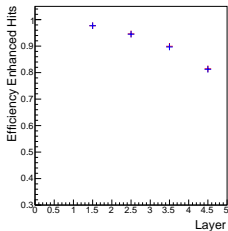
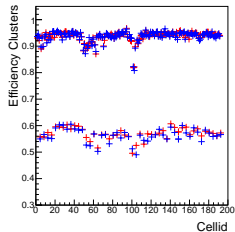
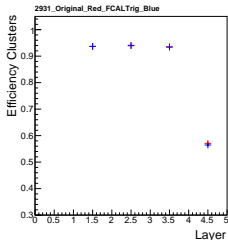
Figure: Left: Run 3179 Mod 7, Right: Run 3182 Mod 8.

## Summary & Questions

- ▶ Previously reported events with no tracks and/or showers are no longer a problem.
- ▶ FCAL shower cut doesn't seem to affect  $\phi$  modulation or overall layer efficiency (except in Run 3079).
- ▶ Forward showers to be ready soon.
- ▶ What else can I consider for  $\phi$  modulation ? (effective velocity ?) What about cosmic runs ?
- ▶ A modified definition for efficiency ?

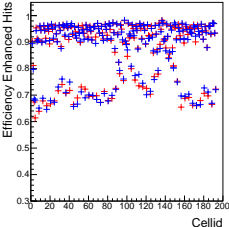
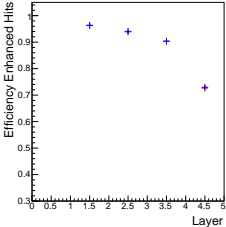
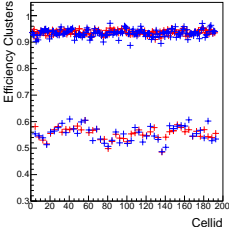
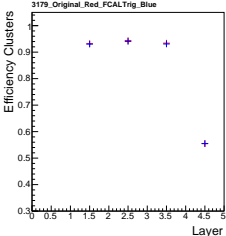
# Backup

Run 2931: No cut red +, FCAL shower cut blue +  
(Ignoring error bars).



# Backup

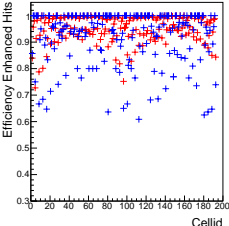
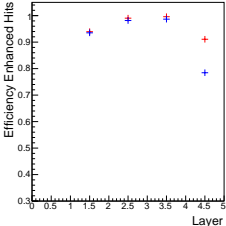
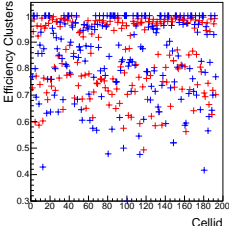
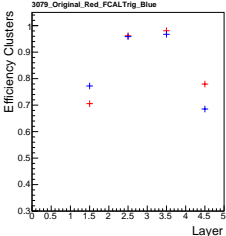
Run 3179: No cut red +, FCAL shower cut blue +  
(Ignoring error bars).





# Backup

Run 3079: No cut red +, FCAL shower cut blue +  
(Ignoring error bars).



# Backup

Run 3182: No cut red +, FCAL shower cut blue +  
(Ignoring error bars).

