

# Progress on L1Cal at Nevis

H. Evans

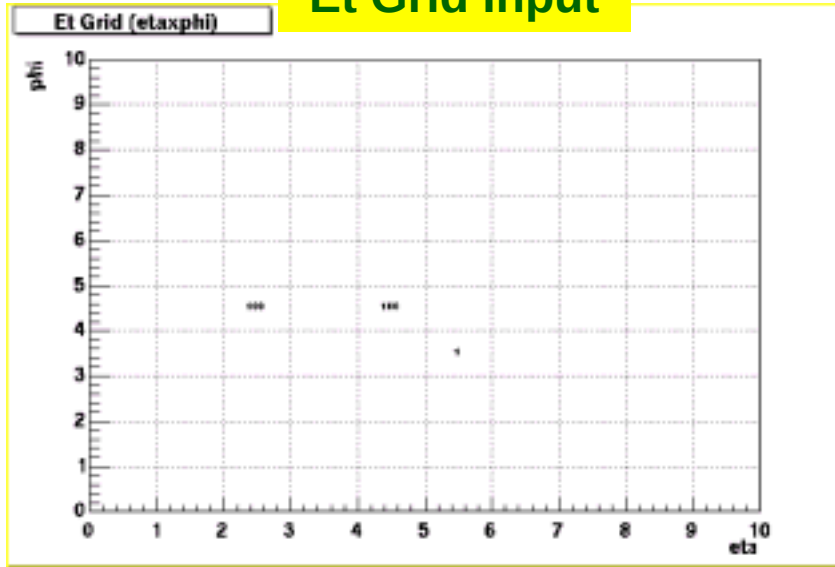
for the Nevis group

## Outline

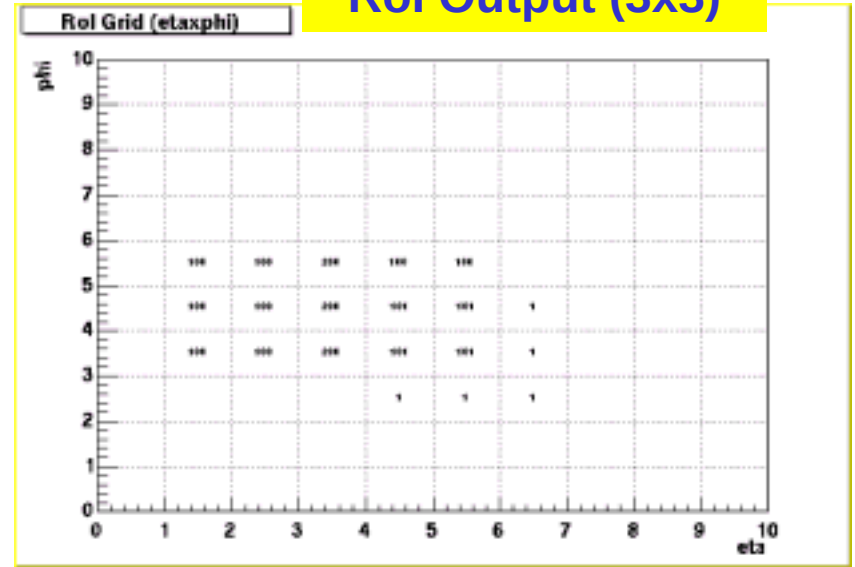
1. RoI Pathologies
2. Communications Paths
3. Latency

# Local Maxima Finding

Et Grid Input



Rol Output (3x3)



Local Max Finding  
uses Rol Grid

|   |   |   |   |   |
|---|---|---|---|---|
| ≥ | > | > | > | > |
| ≥ | ≥ | > | > | > |
| ≥ | ≥ |   | > | > |
| ≥ | ≥ | ≥ | ≥ | > |
| ≥ | ≥ | ≥ | ≥ | ≥ |

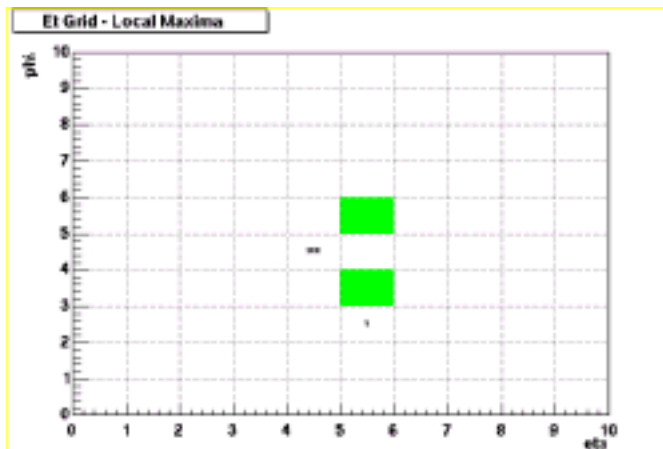
Naming LM Algo's (Declustering)

1. min separation of LMs
2.  $\eta \times \phi$  data required
3. Rol's used

# The RoI Definition Matters

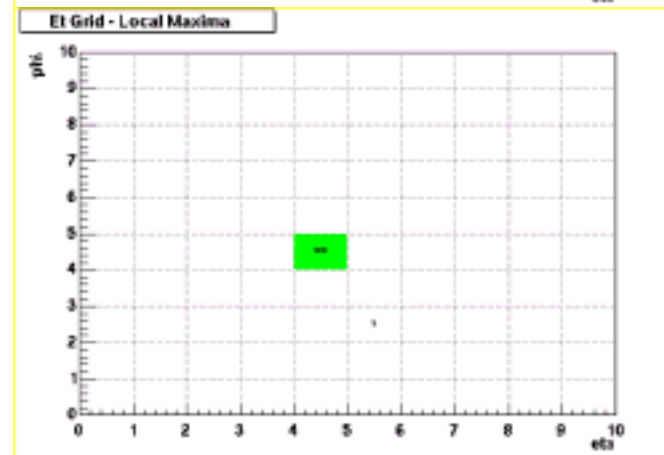
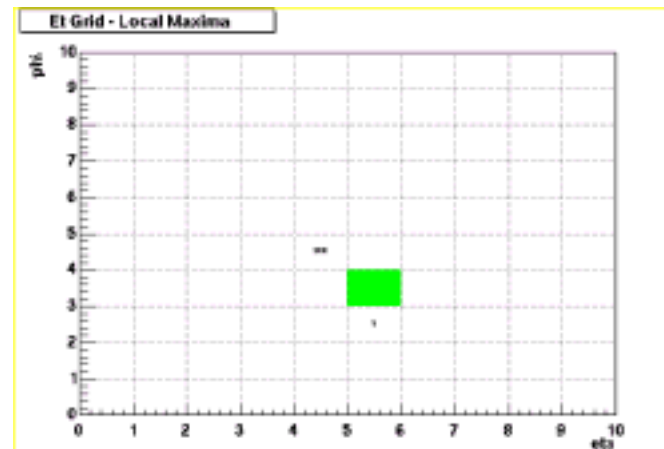
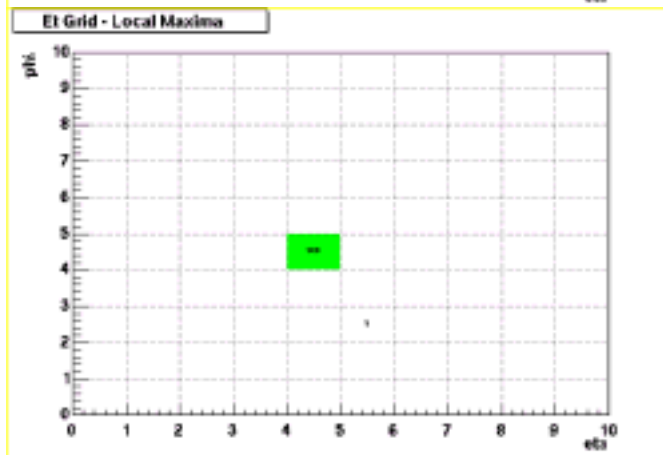
Declust = 3x3

RoI = 3x3



Declust = 5x5

RoI = 2x2

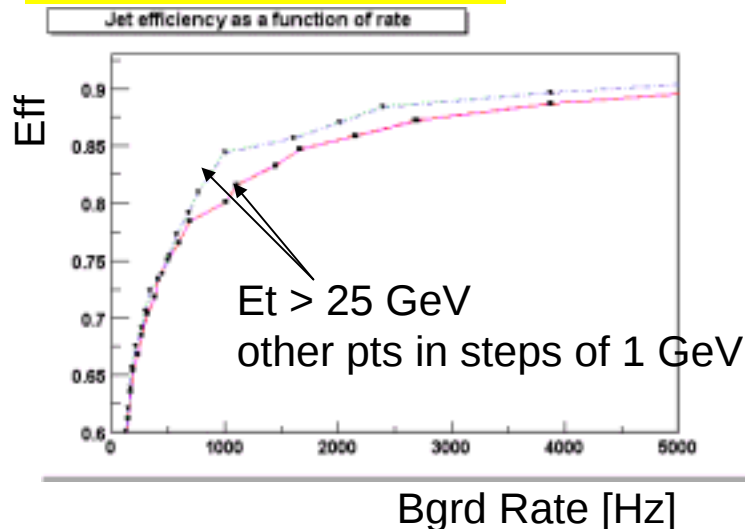


**Conclusion: 2x2 RoI size better matched to asymmetric declustering  
(but still not perfect)**

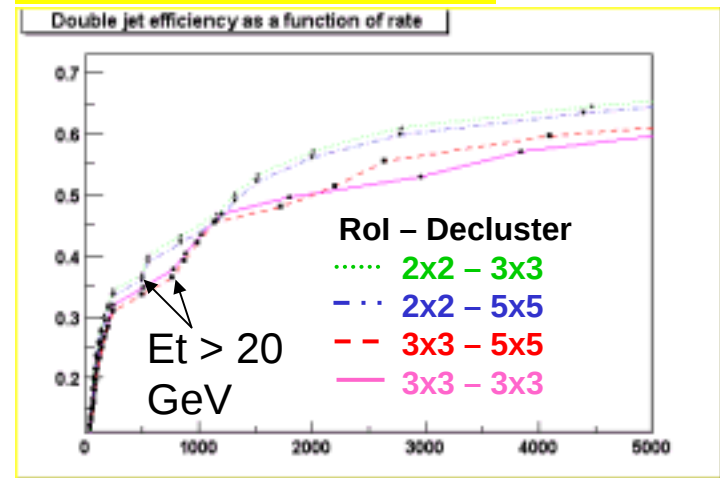
# Different Rols the in MC?

$ZH \rightarrow \nu\bar{\nu}b\bar{b}$  w/ 0.5 min - bias

## Single Jet Trigger



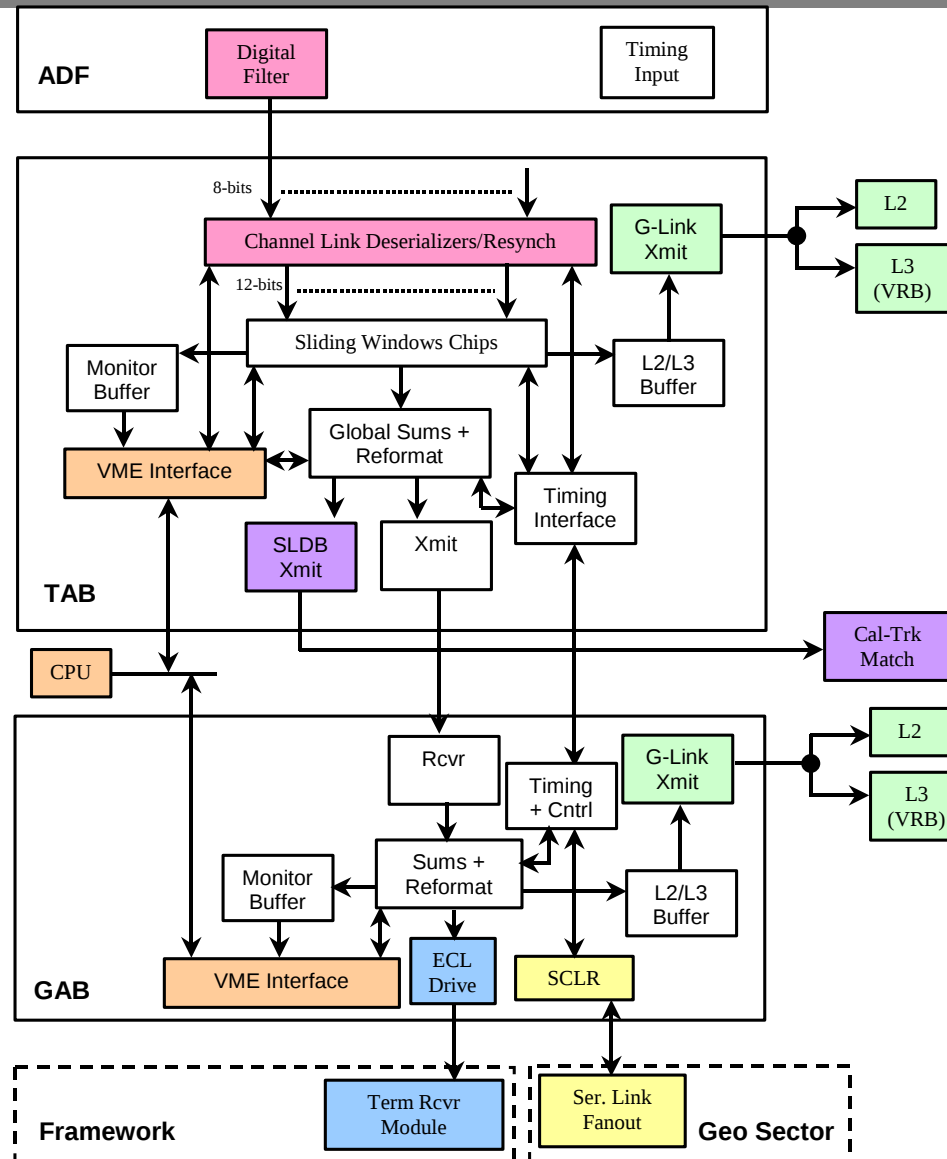
## Two Jet Trigger



J. Mitrevski

- **Warning: study still preliminary**
- **Similar behavior (but less pronounced) in WH and tt**
- **General Conclusions**
  - 2x2 Rol more robust than 3x3 to cluster position shifts
  - 2x2 Rol performance at least as good as 3x3 in MC

# Links in the TAB and GAB



# L1Cal Communications

## 1. ADF to TAB

- assuming Channel Link serializers/deserializers
- need to finalize timing/integrity bits
  - c.f. Denis' presentation

## 2. Serial Command Link

- GAB fans out timing/control
- choose sub-set of signals required for TAB
- final decision on ADF timing source

## 3. Trigger Output to Framework

- hardware required
- first pass set of And-Or terms

## 4. L2/L3 Data

- define data for L2, optimize timing

## 5. Cal-Track Match

- for each phi-slice send 2 8-bit words
  - EM: highest cluster Et & count of no. of clust's in slice
  - Jet: highest cluster Et & count of no. of clust's in slice
- optimize the no. of bits allocated to Et/count

## 6. Downloading/Monitoring

- define what is necessary

# Latency

| L1CAL & CAL-TRK LATENCY  |              |              |                                     |
|--------------------------|--------------|--------------|-------------------------------------|
| updated                  | 22-May-02    |              |                                     |
|                          |              |              |                                     |
|                          |              |              |                                     |
| Step                     | delta-t (ns) | cumul-t (ns) | Notes                               |
| <b>Bunch Crossing</b>    | 0            | 0            |                                     |
| <b>Transmit to ADF</b>   |              |              |                                     |
| BC to ADF                | 650          | 650          | TDR - measured                      |
| <i>sub-total</i>         | 650          | 650          |                                     |
| <b>ADF</b>               |              |              |                                     |
| ADC                      | 165          | 815          | Calvet Talk - 16-May-02             |
| Filter                   | 660          | 1475         | cable delay included in Xmit to ADF |
| Cable to TAB             | 132          | 1607         |                                     |
| <i>sub-total</i>         | 957          | 1607         |                                     |
| <b>TAB</b>               |              |              |                                     |
| Resynch inputs           | 132          | 1739         | TDR - L1Cal section                 |
| Pipelined logic          | 110          | 1849         |                                     |
| Serialize Slide Win out  | 132          | 1981         |                                     |
| Ex,y calculations        | 132          | 2113         |                                     |
| Serialize output         | 132          | 2245         |                                     |
| SLDB to MTCal data ready | 861          | 3106         | TDR - measured                      |
| <i>sub-total</i>         | 1499         | 3106         |                                     |
| <b>CAL-TRK</b>           |              |              |                                     |
| MTCal to MTCM SLDB       | 544          | 3650         | TDR - measured                      |
| SLDB to TFW              | 0            | 3650         | assumes no MTM for Cal-Trk          |
| <i>sub-total</i>         | 544          | 3650         |                                     |
| <b>TOTAL</b>             |              | <b>3650</b>  |                                     |
| TFW decision due         |              | 3300         |                                     |
| Difference               |              | 350          |                                     |