

# Inclusive Selections at the HLT - a possible Road map

Eduardo Rodrigues, CERN

## Some facts:

- Inclusive or semi-exclusive methods have been used in the past in B-studies
  - ↳ e.g. ALEPH, DELPHI analyses of  $B_s$  oscillations
  
- Inclusive methods provide high stats → relevant for searches & studies of rare decays?
  - ↳ e.g.  $B \rightarrow l^+ l^- X$
  
- $\text{Br} ( B^0 \rightarrow K^+ + X ) \sim 80 \%$
- $\text{Br} ( B_s \rightarrow D_s^- + X ) \sim 92 \%$
- $\text{Br} ( B^0 \rightarrow J/\Psi + X ) \sim \text{small}$ 
  - ↳  $\text{Br} ( B_s \rightarrow J/\Psi + \Phi ) \sim 10e-3$
  
- 23 B-decay channels with selection results described in the TDR, of which, e.g.:
  - 8 are of the type  $B^0, B_s \rightarrow J/\Psi + X$
  - 5 are of the type  $B^0, B_s \rightarrow h^+ h^-, h^0 h^0$
  - 2 are radiative decays
  - 2 are of the type  $B_s \rightarrow D_s^- h^+$

# Inclusive Selections at the HLT - a possible Road map (II)

## Road map of questions to be investigated:

- **Main question: can we afford / do we want inclusive selections at the HLT? Most probably !**
  - does the physics group want to have e.g.  $B_s \rightarrow J/\Psi + X$  events?
  - what total HLT bandwidth to give to inclusive / exclusive selections
    - ↳ at present all exclusive TDR selections account for only ~ a few Hz
  
- **What decay categories do we want?**
  - $B^0, B_s \rightarrow J/\Psi + X, D + X, D^* + X, D_s + X, l^+ l^- + X, \dots$
  
- **What strategies for inclusive selections?**
  - pre-selections from official selection algorithms or dedicated selections?
    - ↳ could/should we have such loose selections for most of the TDR channels, for a (pessimistic) estimate of HLT rates?
  
- **What (order of magnitude) rates could we obtain using the present codes for  $J/\Psi, D_s$ , etc. pre-selections as described in the corresponding available offline selections? (e.g.  $B_s \rightarrow J/\Psi + \phi$ )**

# Inclusive Selections at the HLT - a possible Road map (III)

## Road map of questions to be investigated (cont'd):

- What is the status of the HLT rates obtained with the present relaxed selection cuts for the exclusive selections?

- large overlap of studies involving the trigger and physics groups
- to be discussed with physics group ...
- could make use of DC'04 large samples for first tests ...

Expected HLT rates in min. bias events from exclusive selection algo. with relaxed cuts (from Reopt. TDR:)

Channel	HLT rate (Hz)
$B_d \rightarrow J/\Psi(\mu\mu) X$	$21 \pm 4$
$B \rightarrow h^+ h^-$	$12 \pm 3$
$B_s \rightarrow D_s h$	$12 \pm 3$
$B_d \rightarrow K^* \gamma$	$13 \pm 3$
$B_d \rightarrow \phi \gamma$	$14 \pm 3$