



# FCal Efficiencies and Fake Rates

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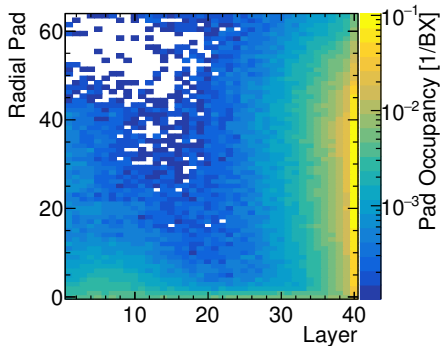
- LumiCal
- BeamCal

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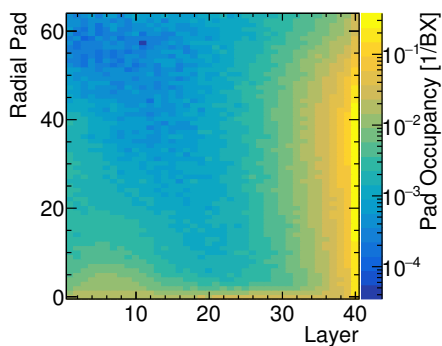
- Simulated 10 25 50 100 190 250 500 750 1000 1000 1250 1500 [GeV] electrons over the BeamCal and LumiCal angular acceptance
- 20k for each energy point
- Reconstructed with BeamCalClusterReco for LumiCal and BeamCal with 40 BX of 3 TeV and 380 GeV incoherent pair background for  $L^* = 6$  m simulated by Dominik Arominski.
  - ▶  $10\sigma$  of background as threshold for LumiCal reconstruction
  - ▶  $3\sigma$  of background as threshold for BeamCal reconstruction

- Occupancies for the LumiCal from incoherent pairs

380 GeV



3 TeV

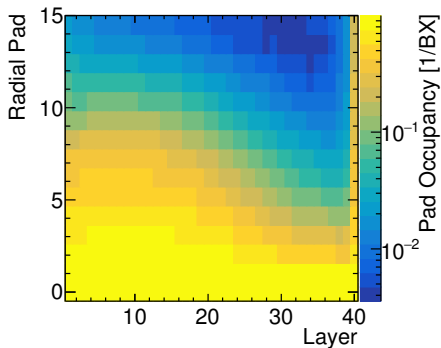


# BeamCal Occupancy

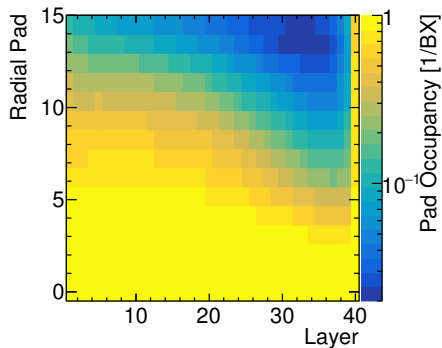


- Occupancies for the BeamCal from incoherent pairs

380 GeV



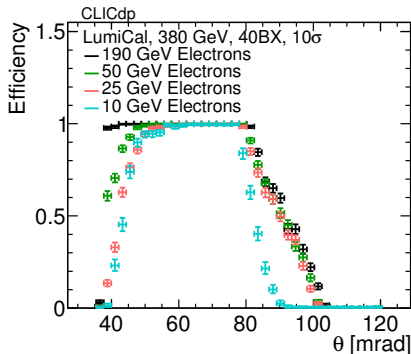
3 TeV



# LumiCal Efficiency at 380 GeV



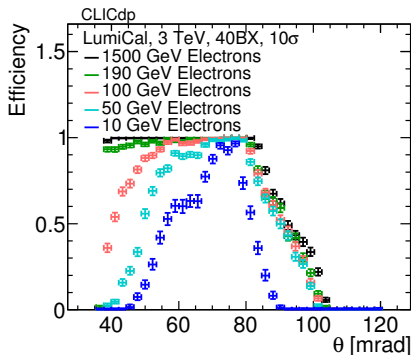
- LumiCal reconstruction efficiency for different energy primary particles
- Matching particles in angle and energy
- Slight loss at the inner edge of the LumiCal
- When LumiCal comes into the shadow of the beam pipe all particles are lost



# LumiCal Efficiency at 3 TeV



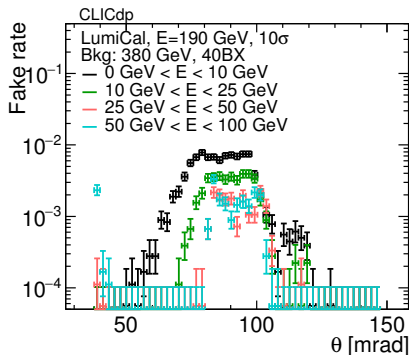
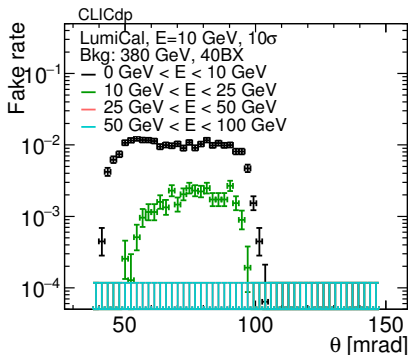
- LumiCal reconstruction efficiency for different energy primary particles
- Matching particles in angle and energy
- Good reconstruction between 1.5 TeV and 190 GeV
- Losses at the inner edge of the LumiCal
- When LumiCal comes into the shadow of the beam pipe all particles are lost
- Not sure about the “saddle” at 60 mrad



# LumiCal Fake Rate at 380 GeV



- Fake cluster: not matched to the primary MCParticle in angle and energy
- Fake rate per 40 BX of background
- Depends on the primary particle because of showering in the beam pipe, which creates fragments that give fake clusters
- use the 10 GeV primary plots in the note?

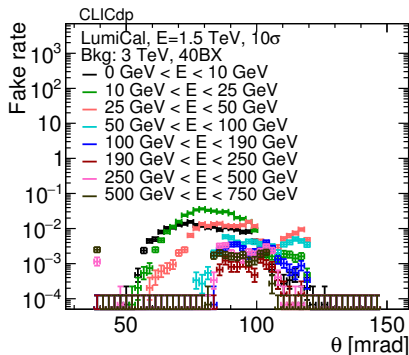
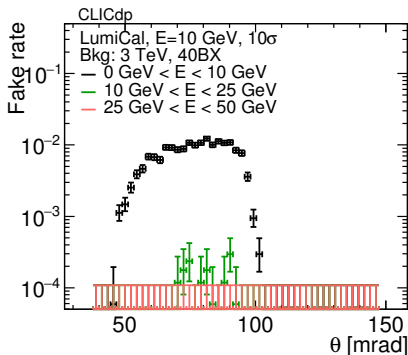




# LumiCal Fake Rate at 3 TeV



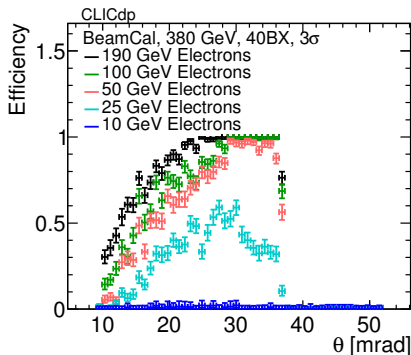
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- use the 10 GeV primary plots in the note?



# BeamCal Efficiency at 380 GeV



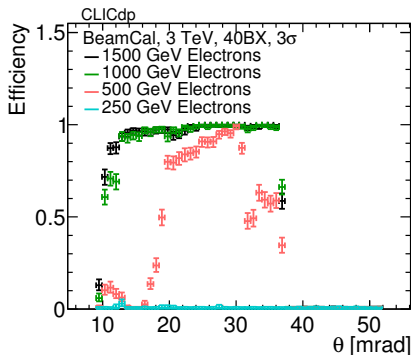
- BeamCal reconstruction efficiency for different energy primary particles
- Matching particles in angle and energy
- Large losses at lower radii for all energies
- Basically impossible to see anything below 20 GeV



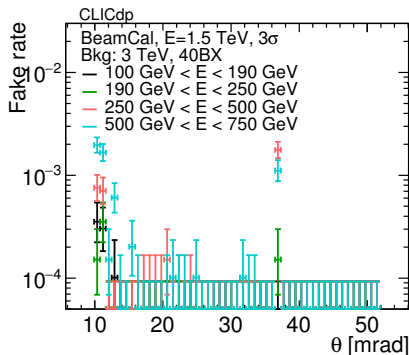
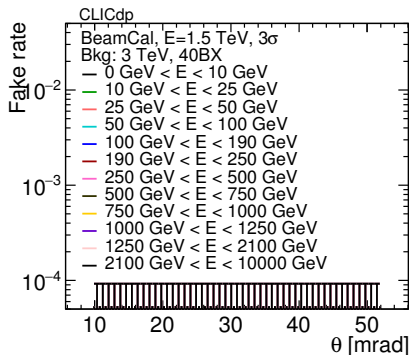
# BeamCal Efficiency at 3 TeV



- BeamCal reconstruction efficiency for different energy primary particles
- High efficiencies down to 1 TeV
- At the lower edge the high background pushes some clusters into the matching criteria
- Matching particles in angle and energy



# BeamCal Fake Rate at 3 TeV



# Todo



## 1 Angular Resolutions