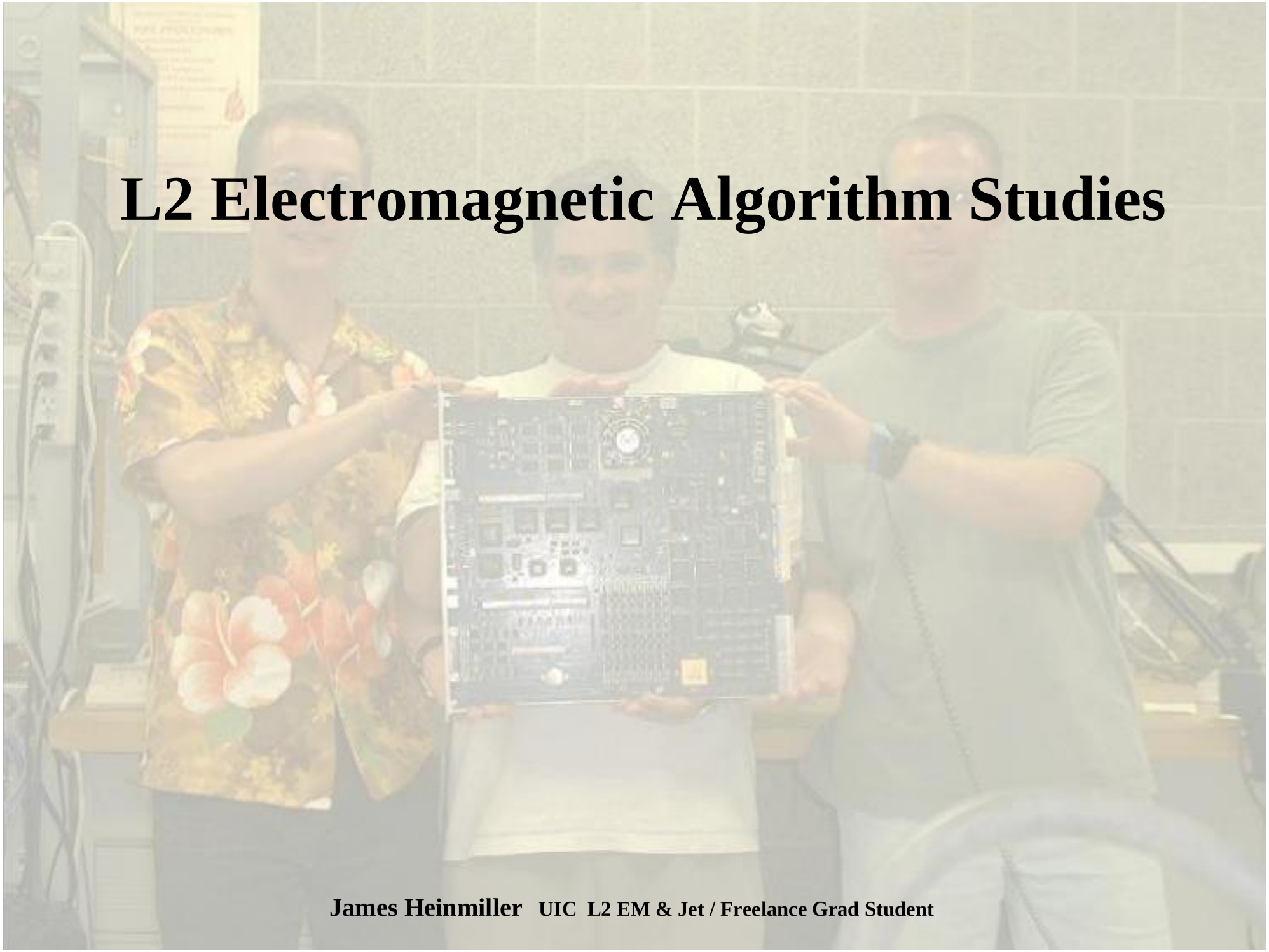
L2 Electromagnetic Algorithm Studies



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x

L1 CEM(1,11) OR CEM(2,6) OR CEM(1,9)CEM(2,3)

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The Situation is Urgent

At Luminosity of 45E30 L2 output rate is at its limit

If no changes to L2 then they will raise the L1 thresholds

Single EM trigger

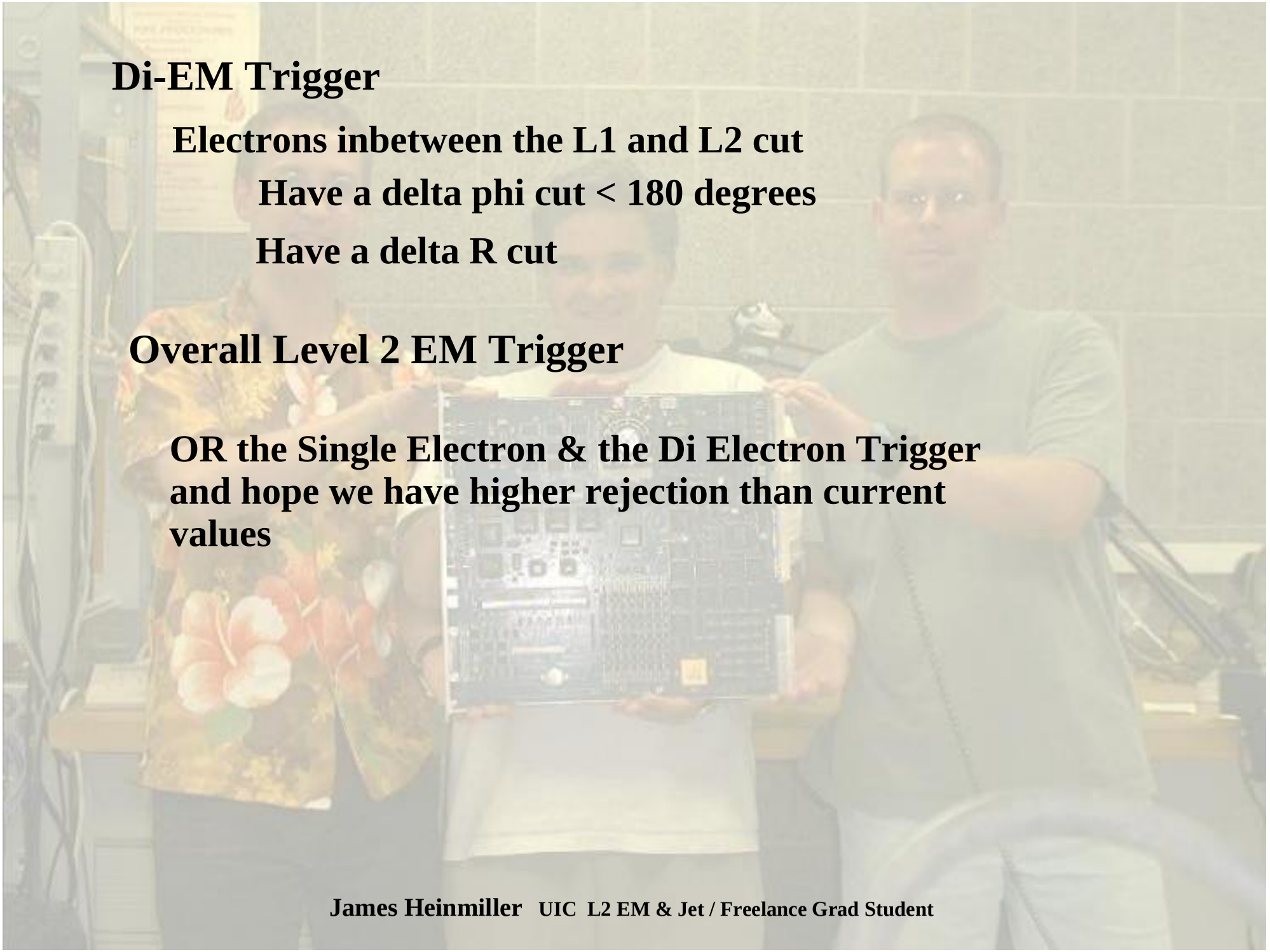
Push the EM turn of point as low as possible given the rate constraints

Two turn separate turnon curve points of importance

The point when an electron in a single TT reaches full efficiency

This is about 80% of the electrons therefore useful for searches

The second point is when the turnon curve reaches 100%
which is seed+neighbor > some threshold



Di-EM Trigger

Electrons inbetween the L1 and L2 cut

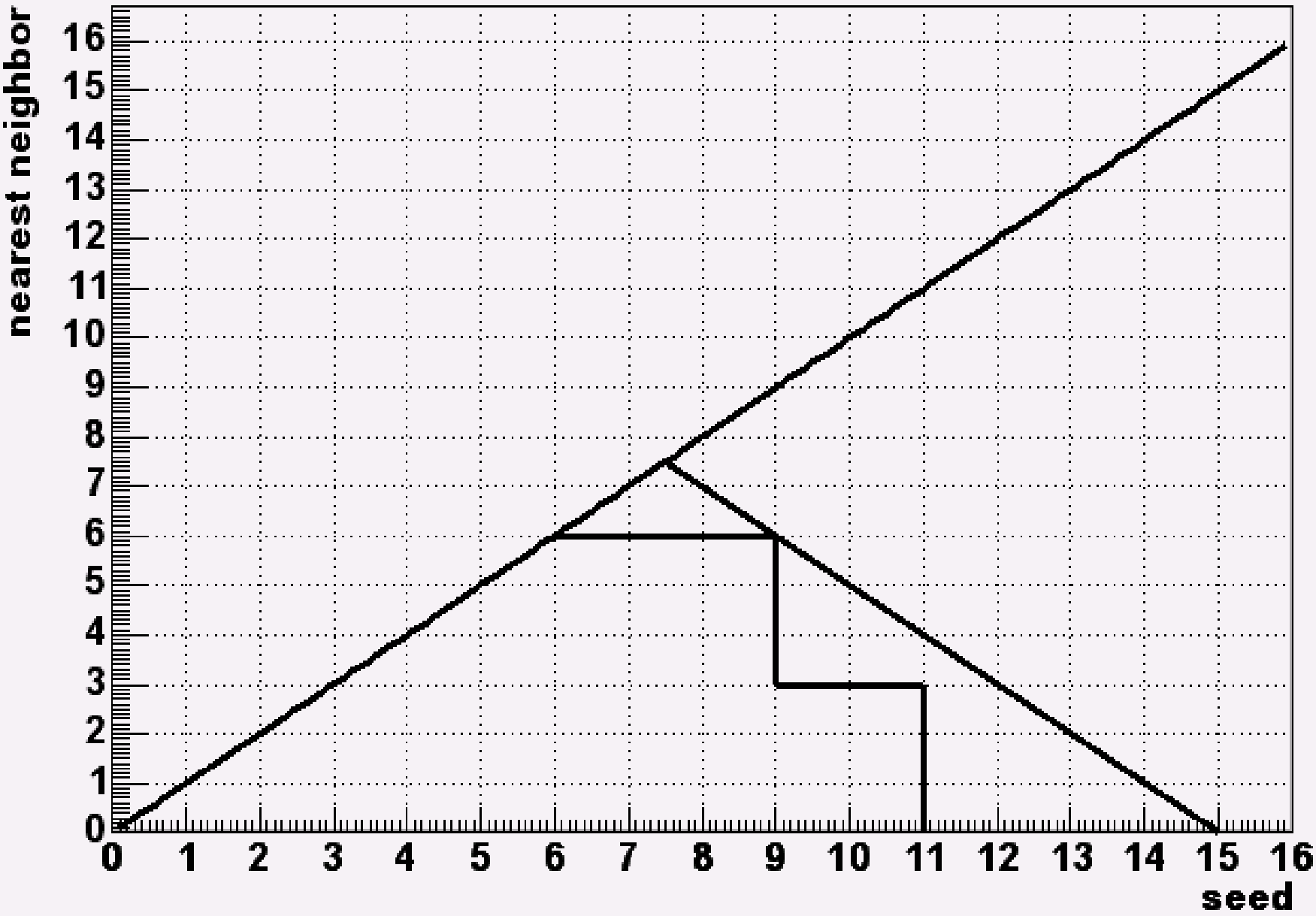
Have a delta phi cut < 180 degrees

Have a delta R cut

Overall Level 2 EM Trigger

OR the Single Electron & the Di Electron Trigger and hope we have higher rejection than current values

L1 CEM or L2 Standard 15 GeV cut for a EM Object



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Goals

Study good electrons and see if there are properties that we can exploit

- some claims –
  the majority of the electrons do not have a nearest neighbor
  the phi neighbor can be ignored
  the current em fraction for L2 is not trustworthy

Method

Use Z to e+ e- real events using defining L3 electrons with emfraction above 95% and energy above 20 Gev

Use a back-ground sample – special run # 176363
30APR03 CEMor CJTor low energy to calculate REJECTION

Sanity Plots

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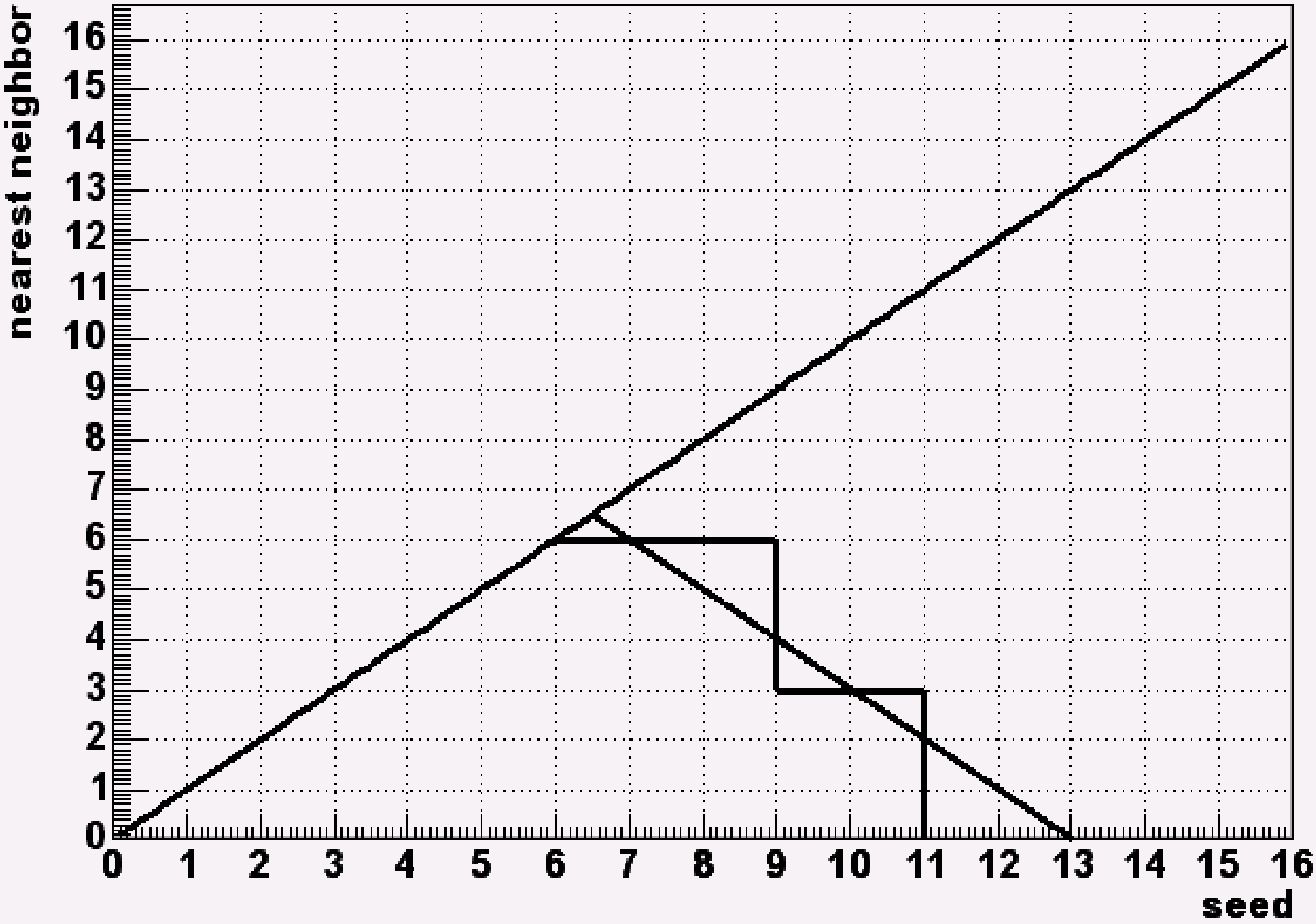
L1 CEM or L2 13GeV Standard Seed + Nearest Neighbor



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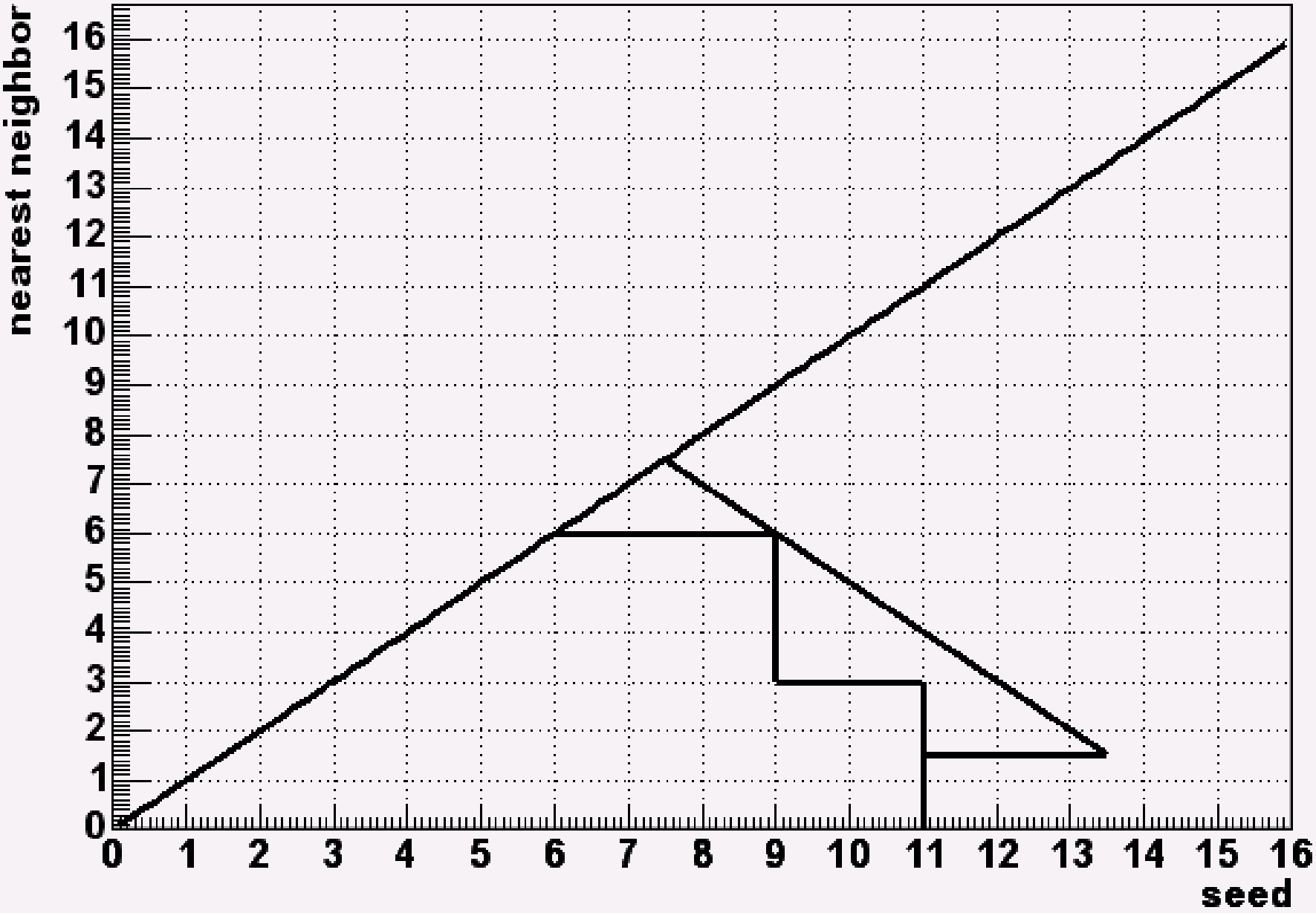
L1 CEM or L2 NN<1.5 CEM(1,11) else CEM(1,15)



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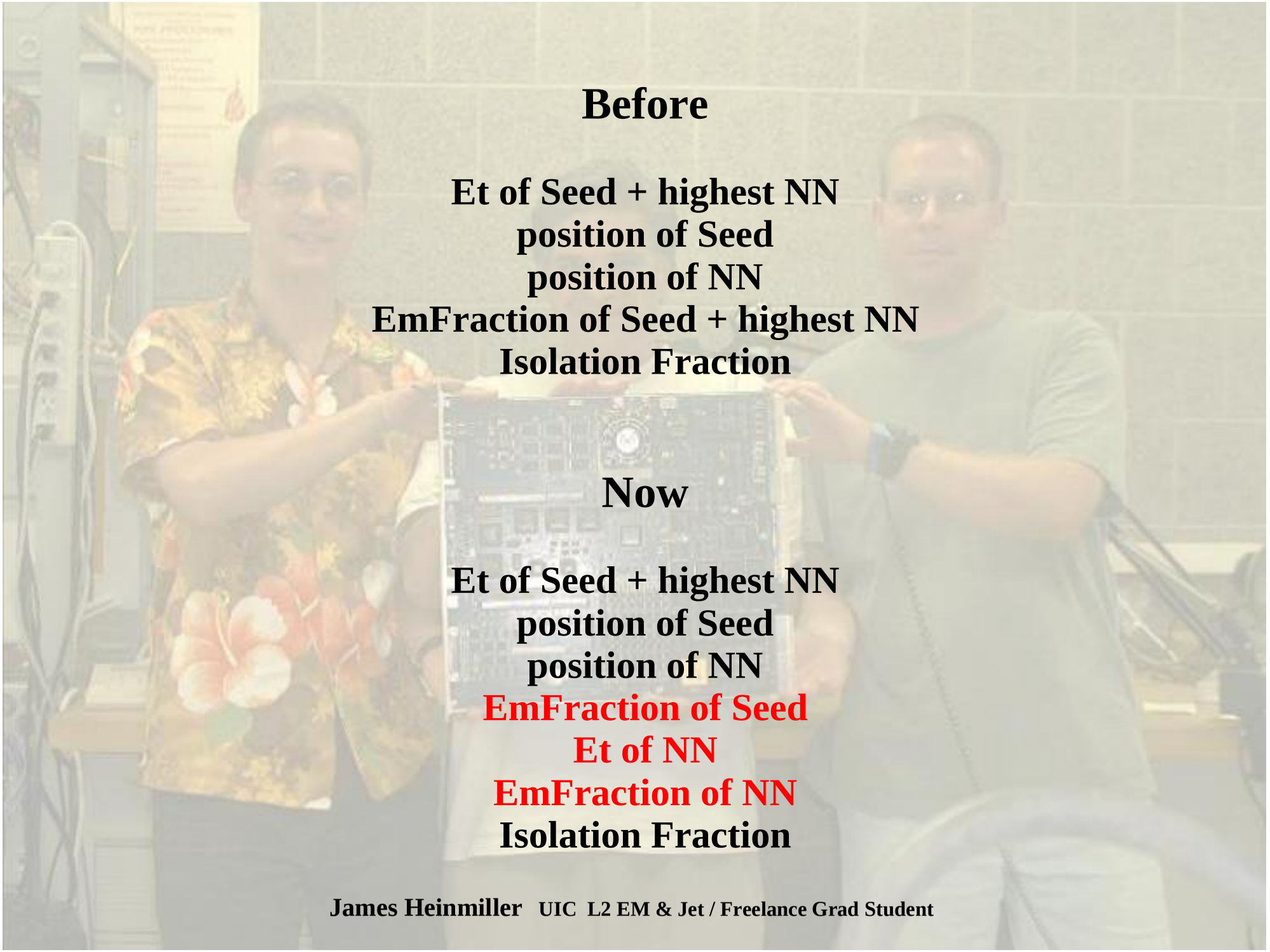

Before

Et of Seed + highest NN
position of Seed
position of NN
EmFraction of Seed + highest NN
Isolation Fraction

Now

Et of Seed + highest NN
position of Seed
position of NN
EmFraction of Seed
Et of NN
EmFraction of NN
Isolation Fraction

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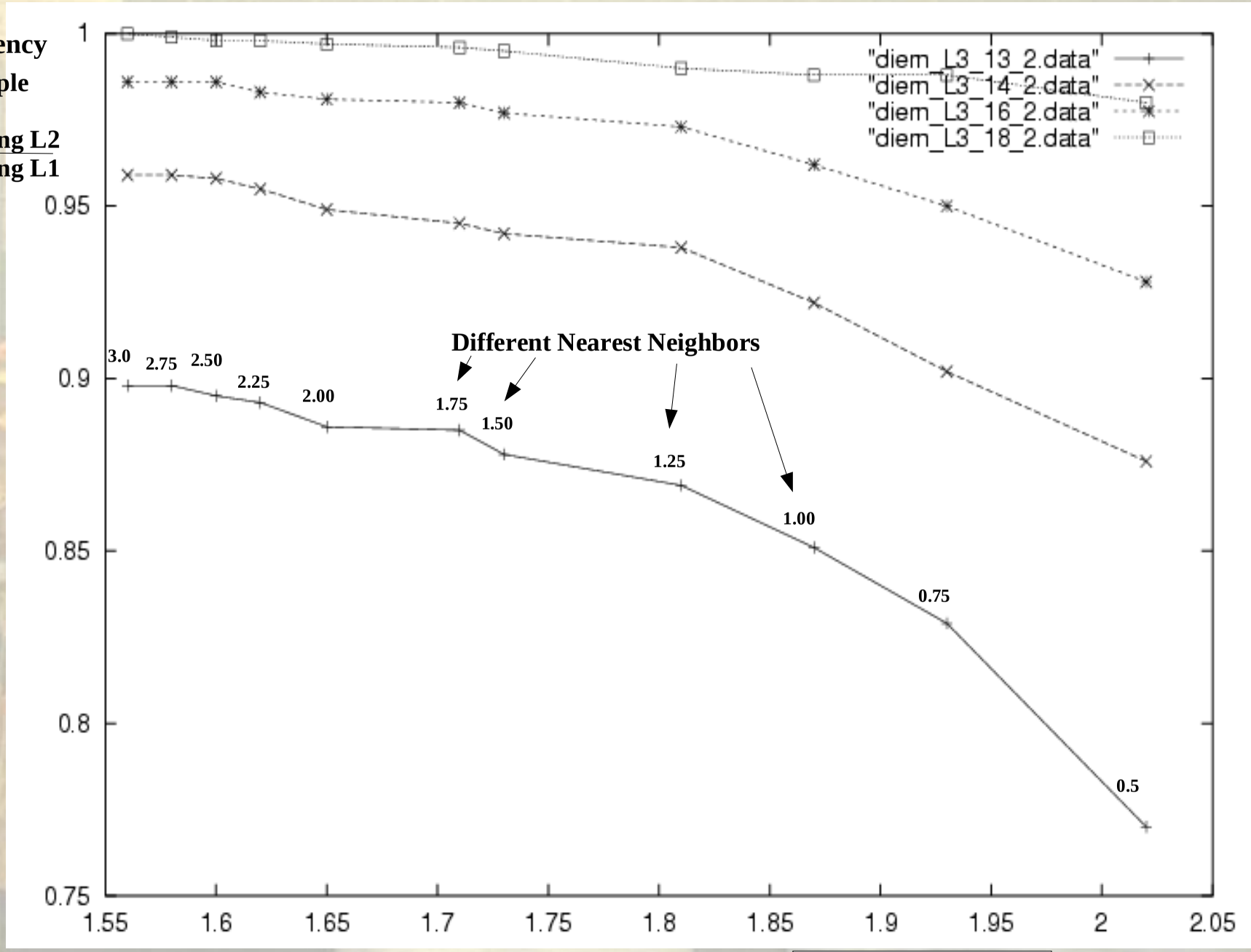
Efficiency

Signal Sample

 # Events Passing L2
 # Events Passing L1



Background Sample

 # Events Passing L1
 # Events Passing L2

Rejection

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