Direct Reco Upgrade Progress – Likelihoods and oversampling

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Changes to the setup

 The GCD file is now the "realistic" upgrade detector but all modules are DEggs



- Uses realistic ice instead of homogeneous ice
- DEgg acceptance curve has been modified to be more realistic -> more realistic light yield
- Still uses no noise sim or PMT sim

Two events event examples





Current problems

• When doing reconstruction, minimizer is bimodal in the number of iterations

 Reconstruction of energy is not as good as expected

> Reconstruction parameters: Oversampling: 100 Seed : Uniform sampling





Seed vs. Reconstruction result correlations

- A lot of reconstructions stays close to seed -> when iterations are small
- When seed far away from truth -> more iterations -> better reconstruction
- Small seed better than large seed
 - Reason: Probably because likelihood is steeper at low energies





Energy likelihood scan investigation [1/3]

- Average likelihood looks good
- How about for individual events?

Likelihood parameters: Oversampling: 100 Events: 100



Energy likelihood scan investigation [2/3]

- Very noisy! •
- Hard to spot that minimum ۲ should be at 50
- Reasons might be: ۲
 - Not enough information in data ٠
 - Hypothesis is too noisy ٠ -> need more oversampling!



45

40

H 1690 1680

1670

1660

1650

35



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65

55

60



Energy likelihood scan investigation [3/3]

• MORE OVERSAMPLING!

















Back to reconstruction – Only fit energy, rest is set to true



What is next?

- Find optimal oversampling value
- Try large oversampling and fit all parameters
 - Will iterations still be bimodal?