Simulation vs. Hypothesis

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Trying to make simulation and hypothesis match

- Testing joint parameters in Simulation and CLShim

- Parameters
  - DomEfficiencyCorrection (used in calculation of wavelengthAcceptance)
  - PhotonWeight (Used in sim to calculate HitProbability, in CLShim to calculate weight)
  - RDE (Used in sim to calculate HitProbability, in CLShim not sure)

DomEfficiencyCorrection

- Simulation

UnshadowedFraction = 1.0

domAcceptance = clsim.GetIceCubeDOMAcceptance(domRadius = DOMRadius*DOMOversizeFactor, efficiency=UnshadowedFraction)

- CLShim

domEfficiencyCorrection = UnshadowedFraction*maxAngularAcceptance = 0.67

domAcceptance = clsim.GetIceCubeDOMAcceptance(domRadius = DOMRadius*DOMOversizeFactor, efficiency=domEfficiencyCorrection)

HitProbability/Weight

- Simulation

hitProbabilty = photon.GetWeight()*wavelengthAcceptance*angularAcceptance*RDE

If hitProbability =< random.normal(0,1) continue

- CLShim

weight = photon.GetWeight()*wavelengthAcceptance*angularAcceptance / oversampling

sources[sourceidx].amplitudes(receiver_offsets[*receiver.omkey] + binidx) += weight

- Q: why add to amplitude and not multiply?

Comparisons

- Simulation

hitProbabilty = photon.GetWeight()*wavelengthAcceptance* angularAcceptance*RDE

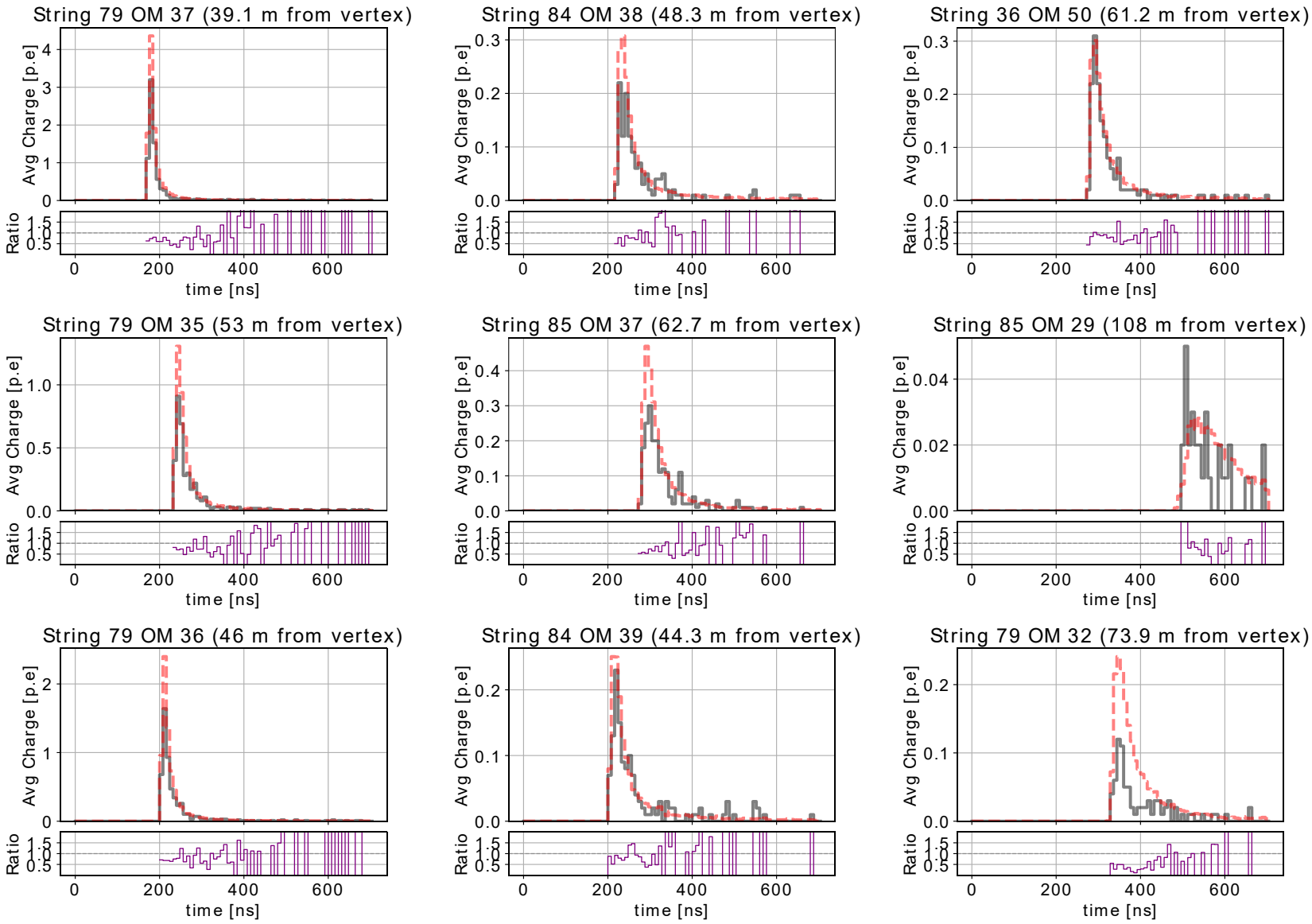
If hitProbability =< random.normal(0,1) continue

- CLShim

weight = ~~photon.GetWeight()~~*wavelengthAcceptance* angularAcceptance / oversampling

sources[sourceidx].amplitudes(receiver_offsets[*receiver.omkey] + binidx) += weight

File: test_reco_hypo_no_det_sim/, average over 100 events
Black: Data, Color: Red



Comparisons

- Simulation

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hitProbabilty = photon.GetWeight()*wavelengthAcceptance*angularAcceptance*RDE

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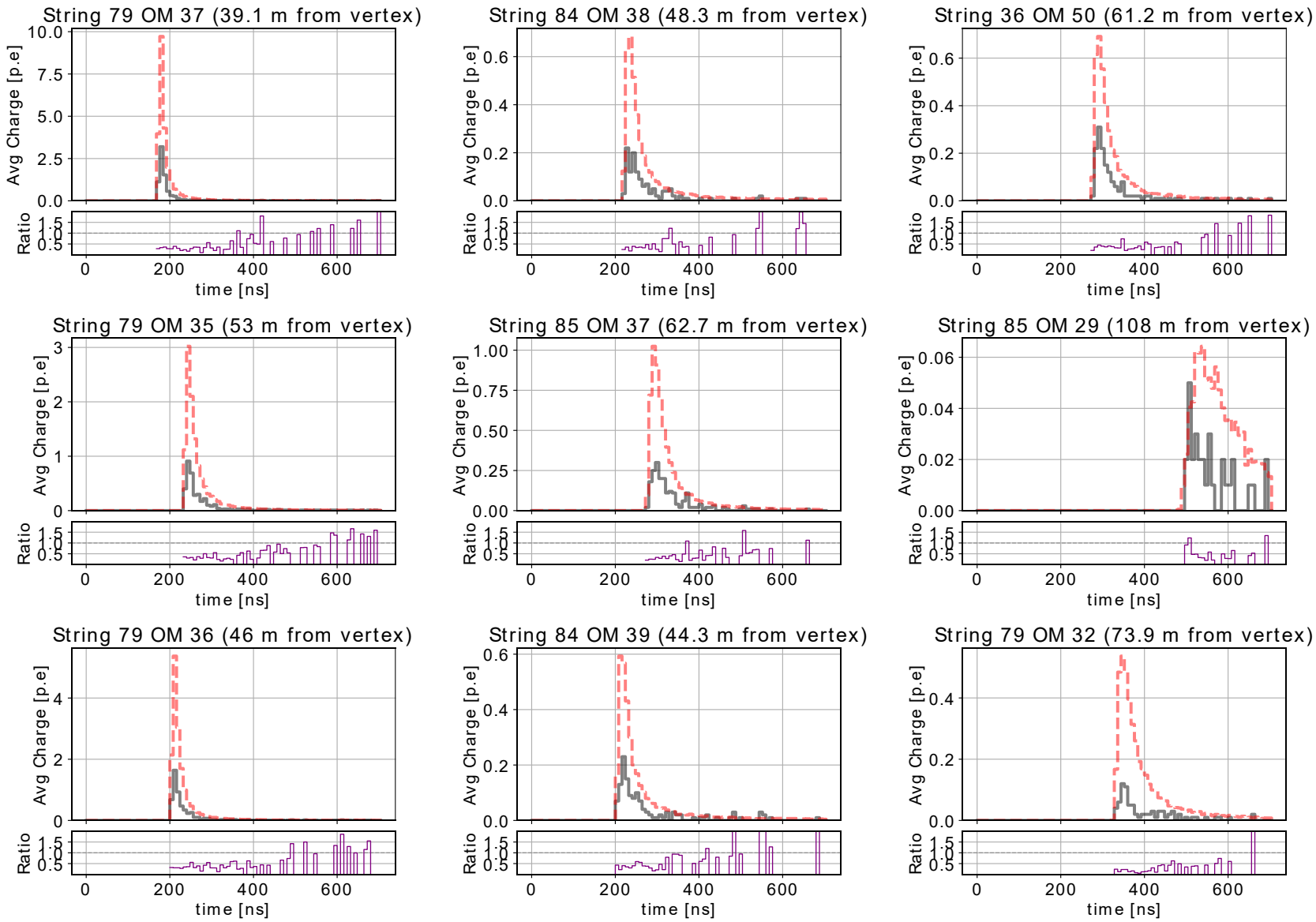
- CLShim

domEfficiencyCorrection = 1.0 (0.67)

weight = ~~photon.GetWeight()~~*wavelengthAcceptance*angularAcceptance / oversampling

sources[sourceidx].amplitudes(receiver_offsets[*receiver.omkey] + binidx) += weight

File: test_reco_hypo_no_det_sim_domeffcorr/, average over 100 events
Black: Data, Color: Red



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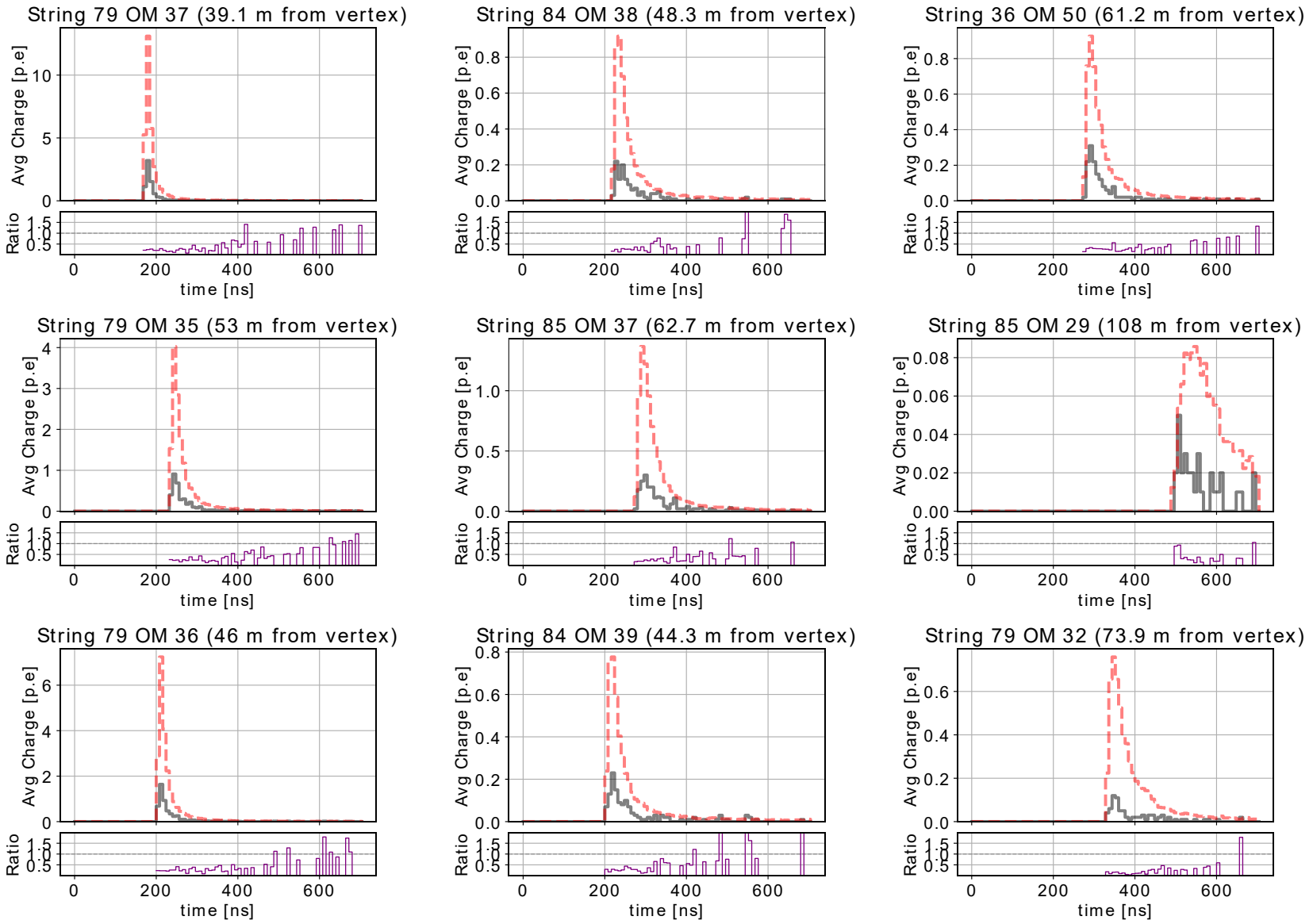
File: test_reco_hypo_no_det_sim_rde_domeffcorr/, average over 100 events
Black: Data, Color: Red



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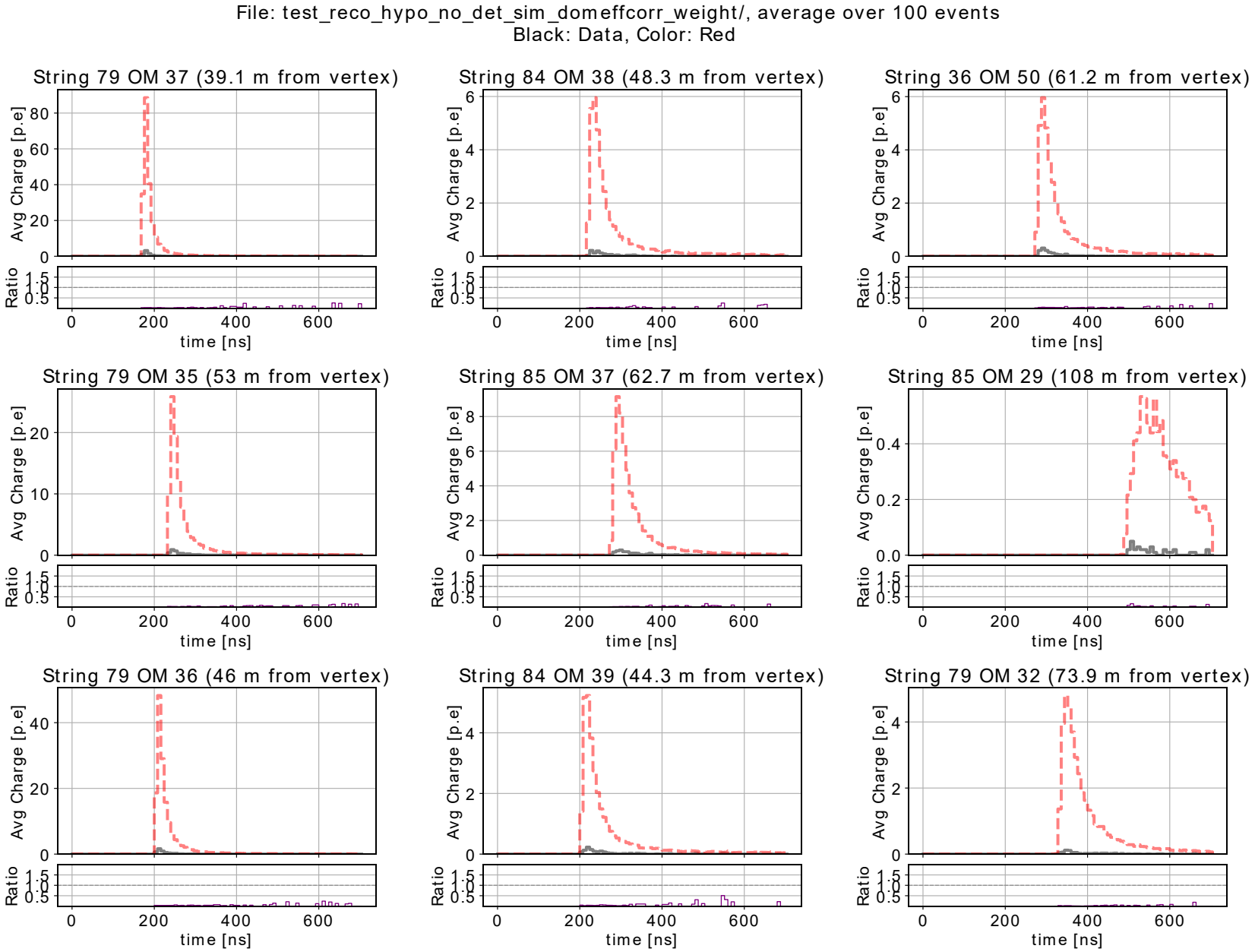

ToDo

- Look into how we extract the hypothesis from millipede, are we doing this correctly
- What factors does millipede use
- ??