



LOUISIANA STATE UNIVERSITY

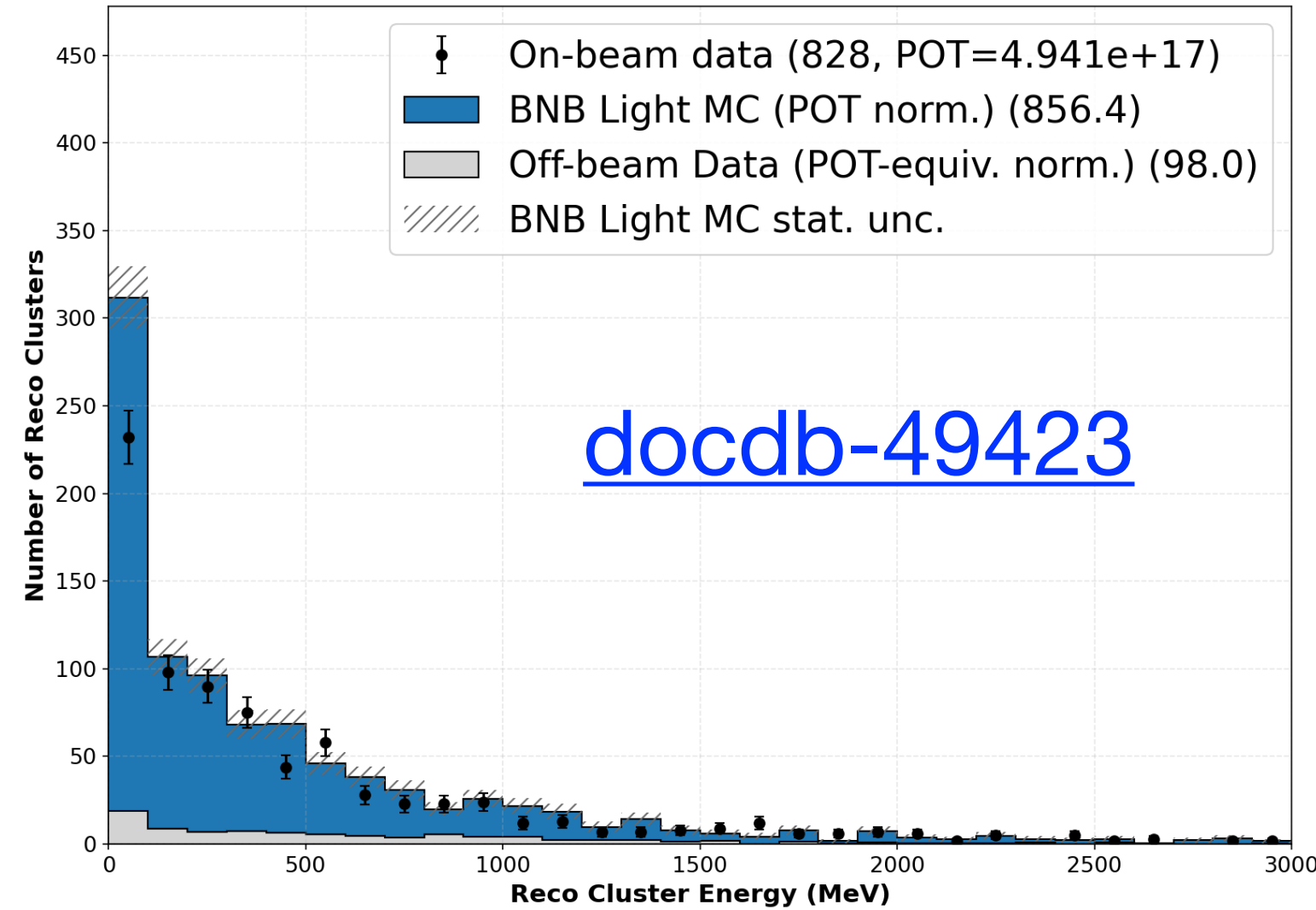


Status and Next Plans for Cluster Evaluation

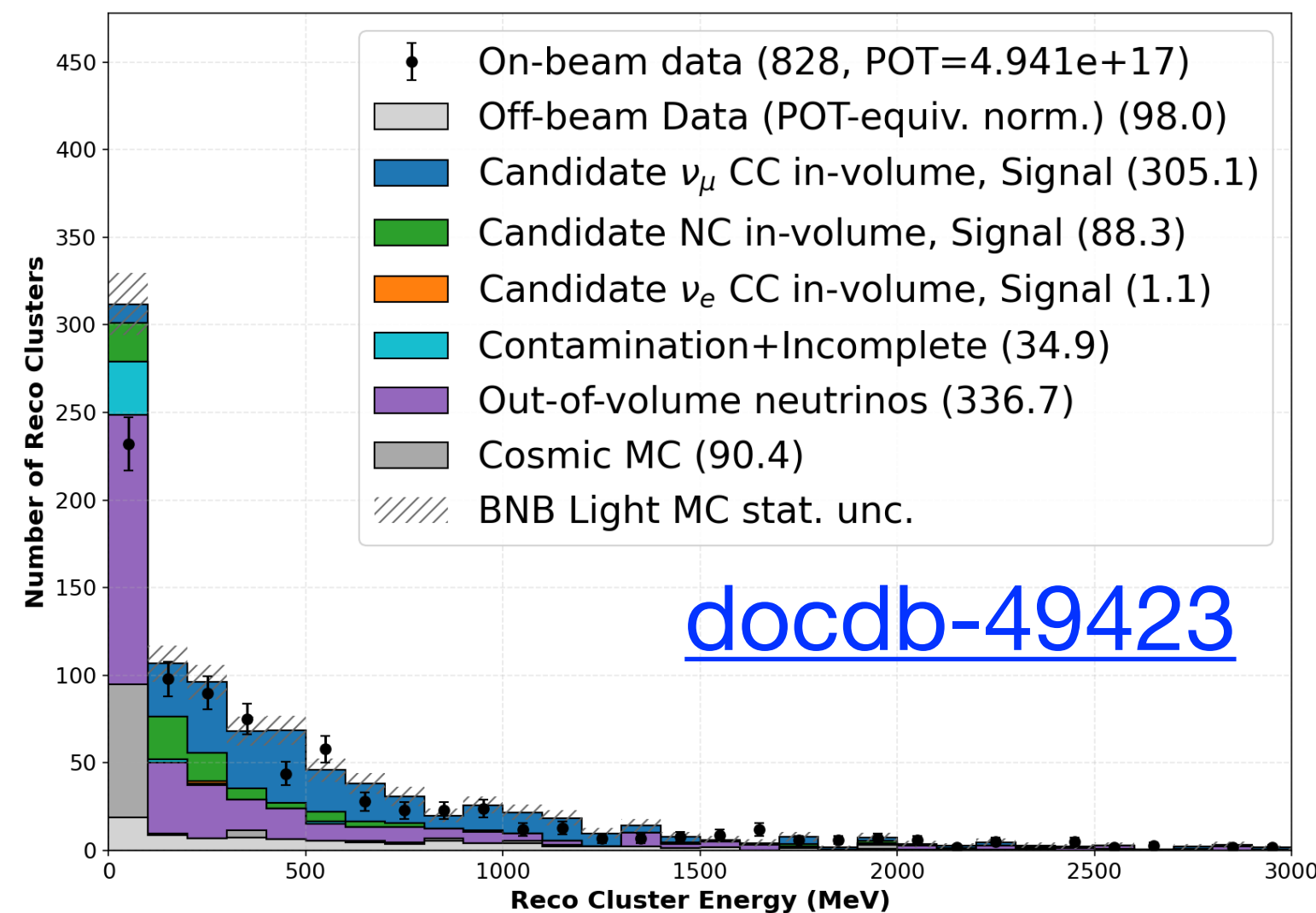
SBND Wirecell Meeting

Prabhjot Singh, 24 Sep 2026

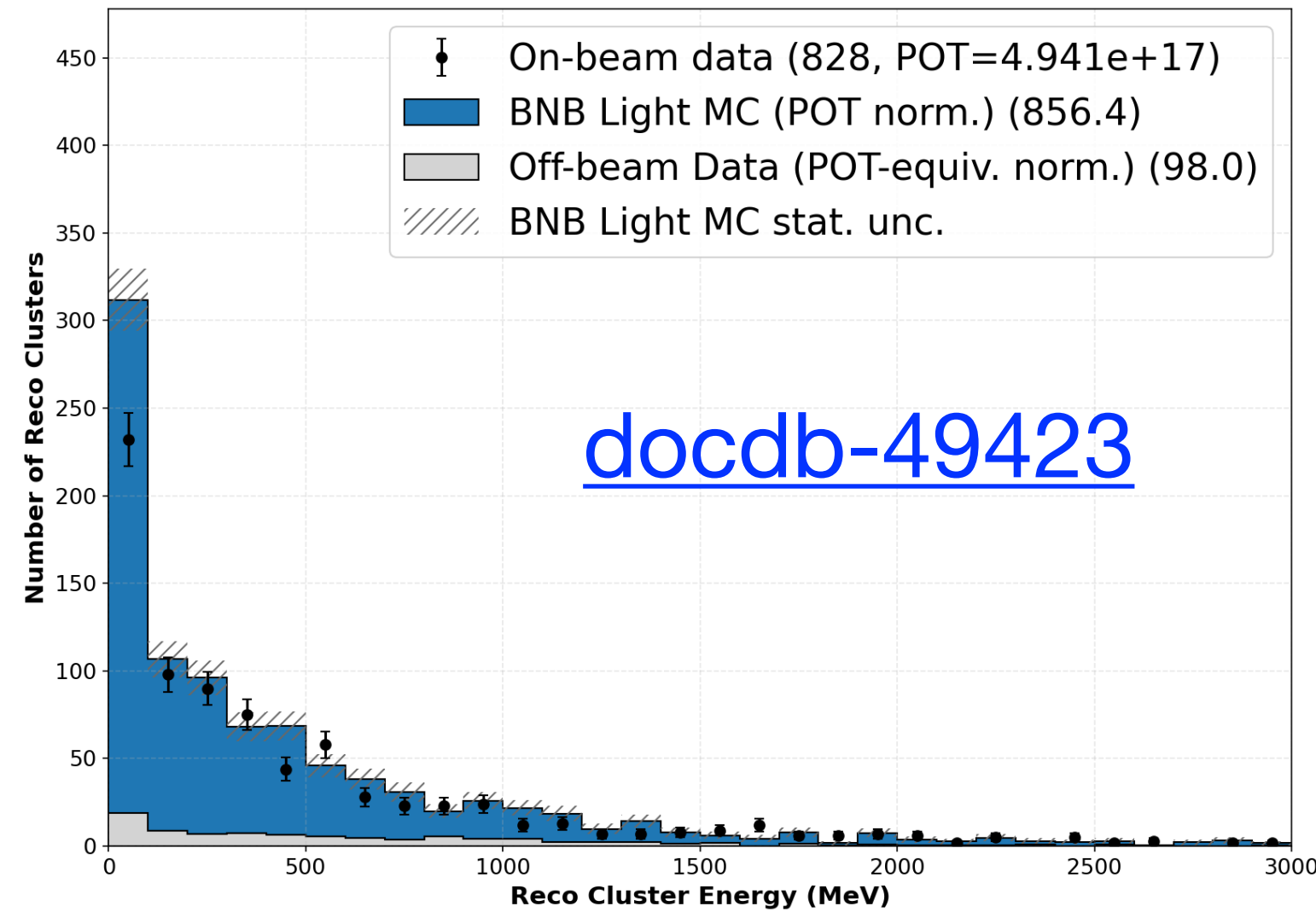
Introduction



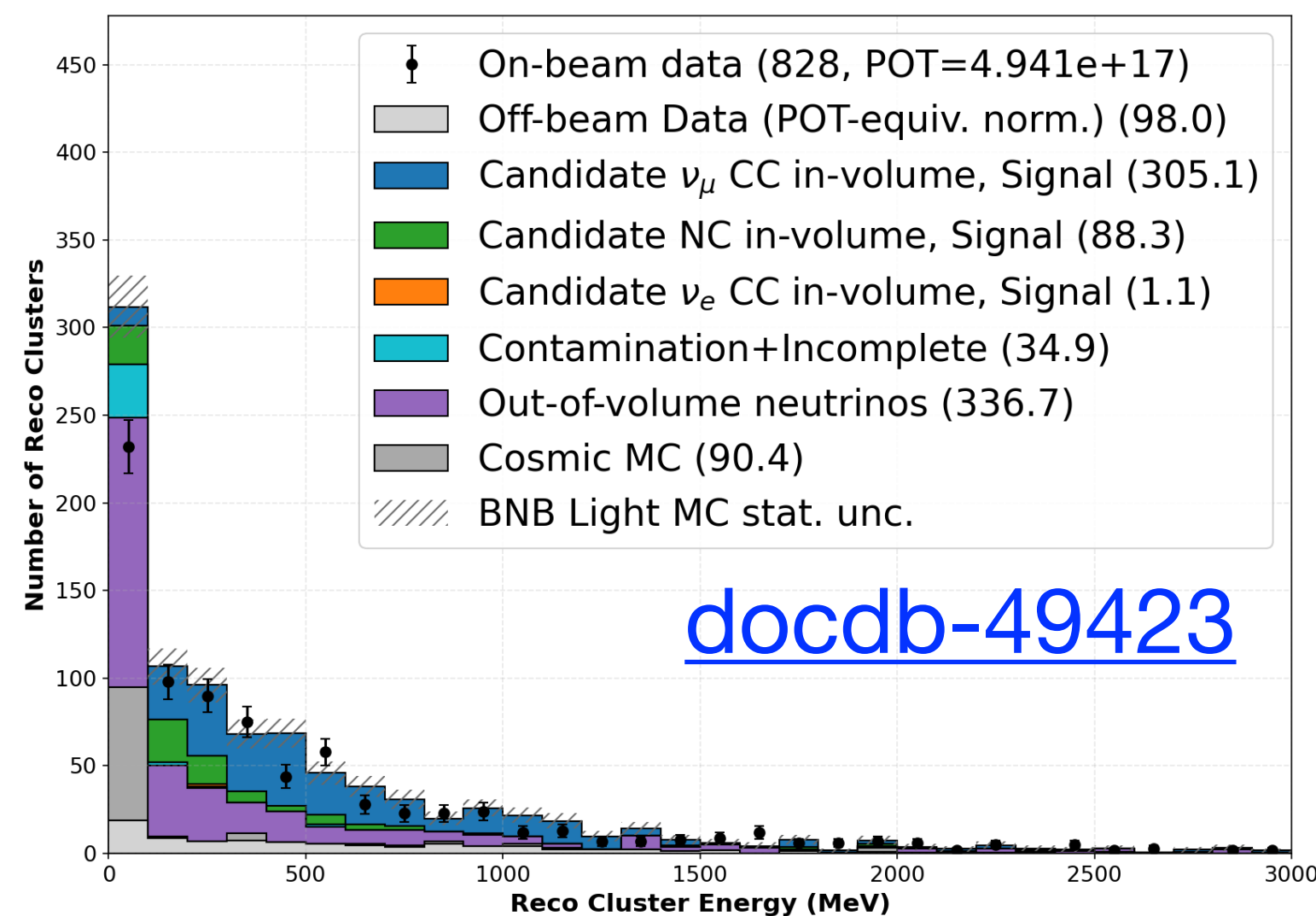
- We presented status of generic neutrino selections in SBND Sim/Reco meeting on 22 Sep in [docdb-49423](#) and showed the data and MC agreements which looked great
- We concluded that since the Data/MC agreements looked great implying stage1, up to in-beam selections, looks good and we can move ahead with Production plans leading to second stage including particle-recognition (PR)



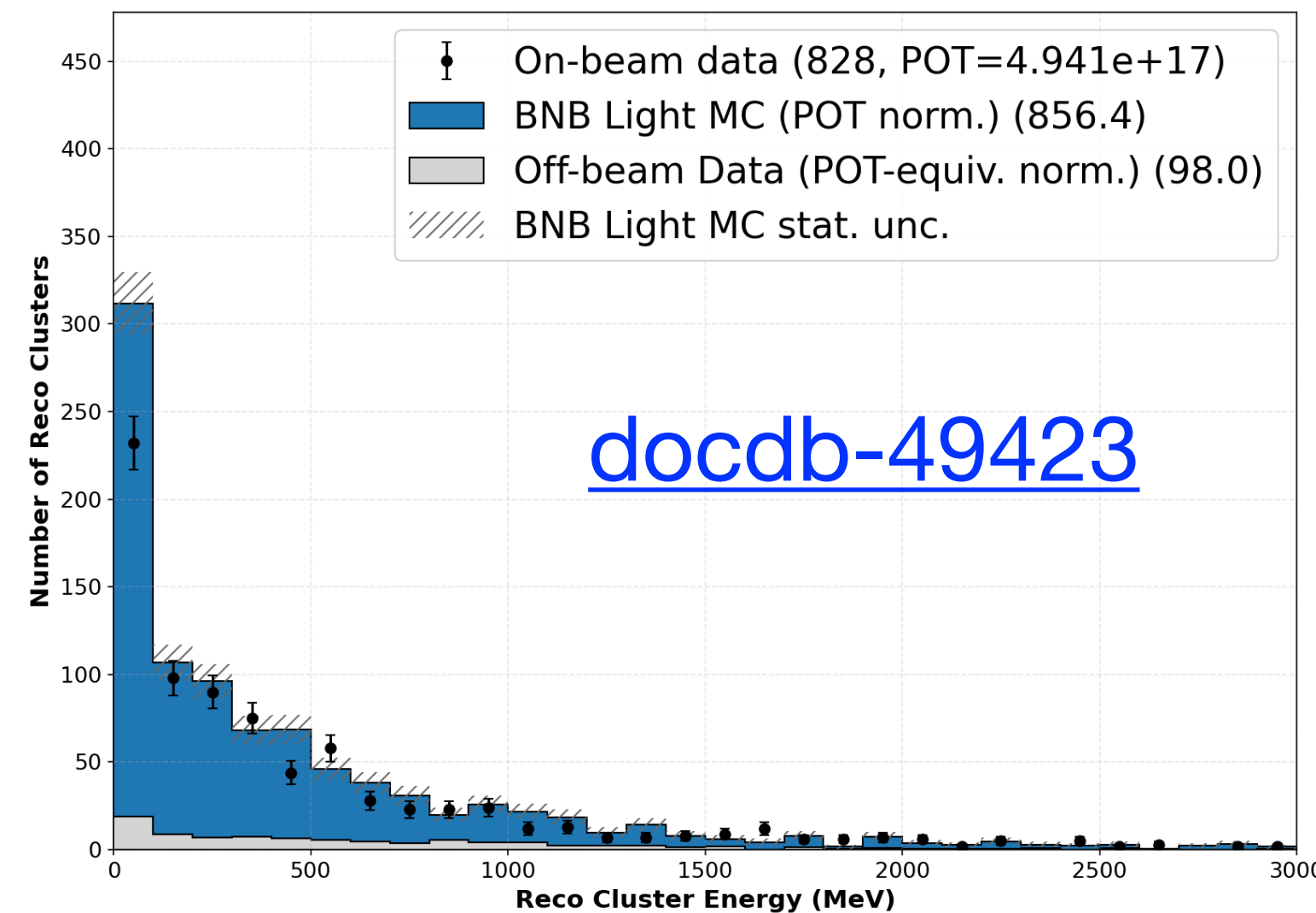
Changed Threshold Energy



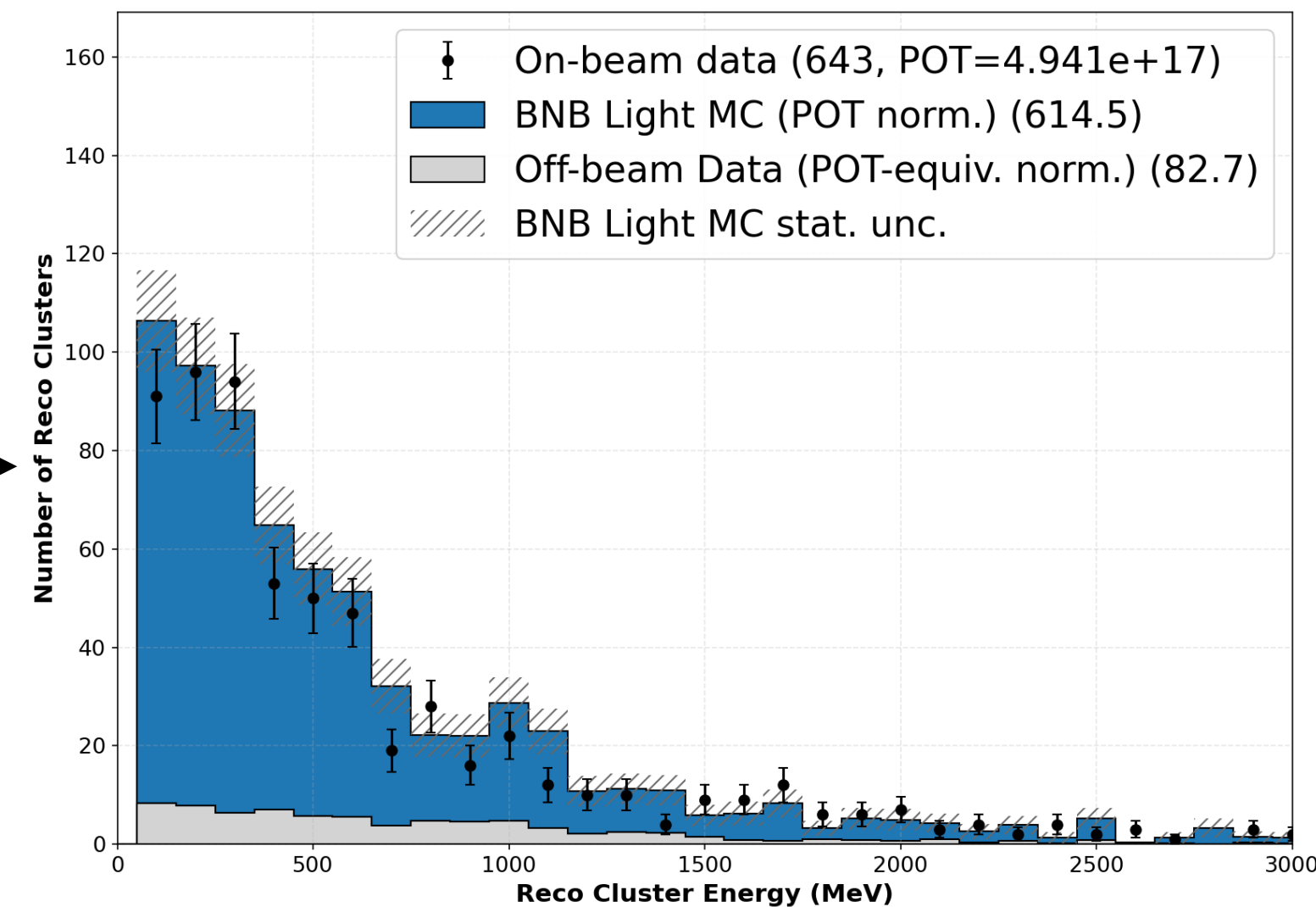
- The low energy bin we used is 0-100 MeV
- Low energy reconstruction is challenging due to low signal which can lead to incorrect charge-light matching
- I have remade this plot by applying a 50 MeV cut and started the low bin from 50 MeV



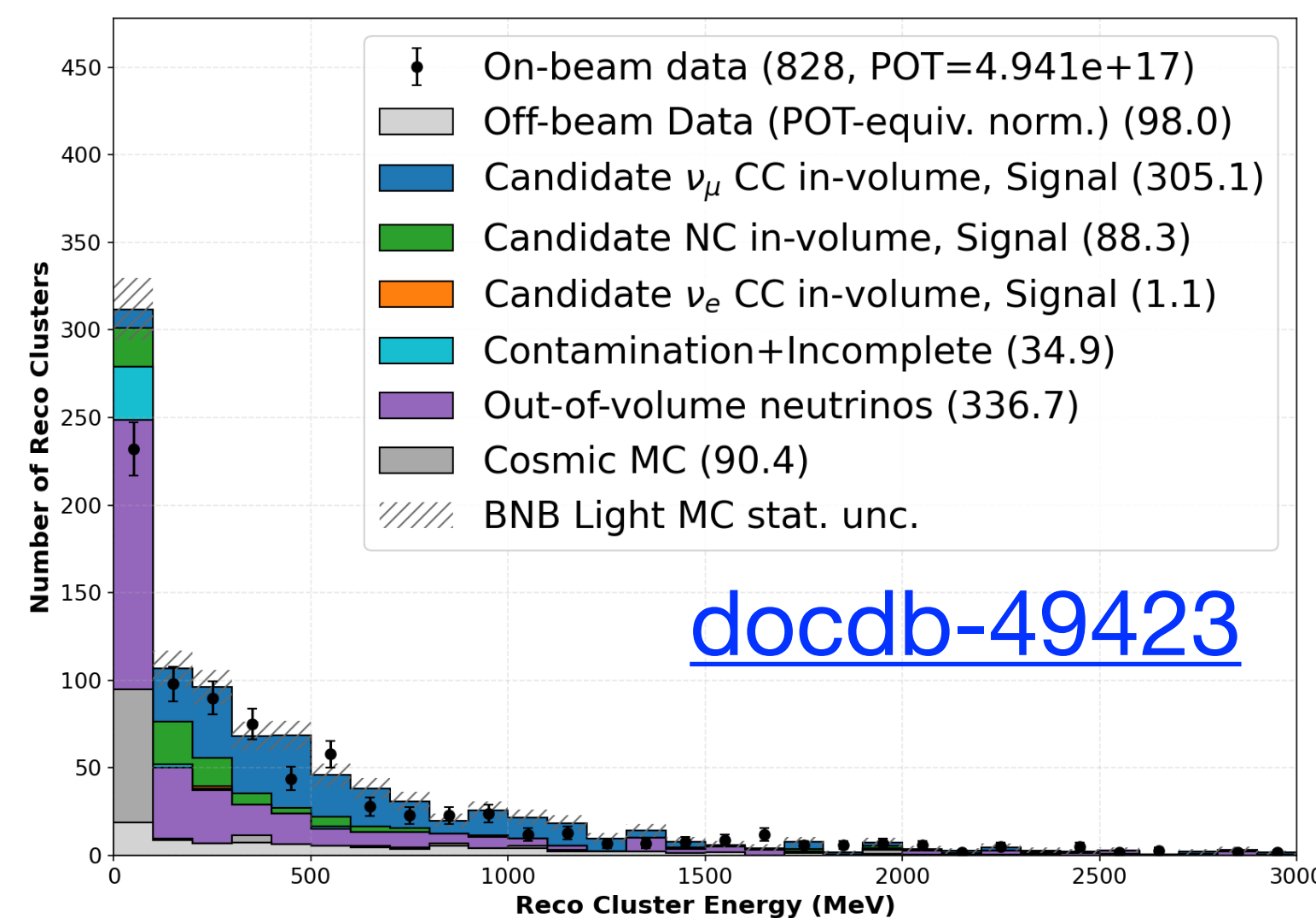
Changed Threshold Energy



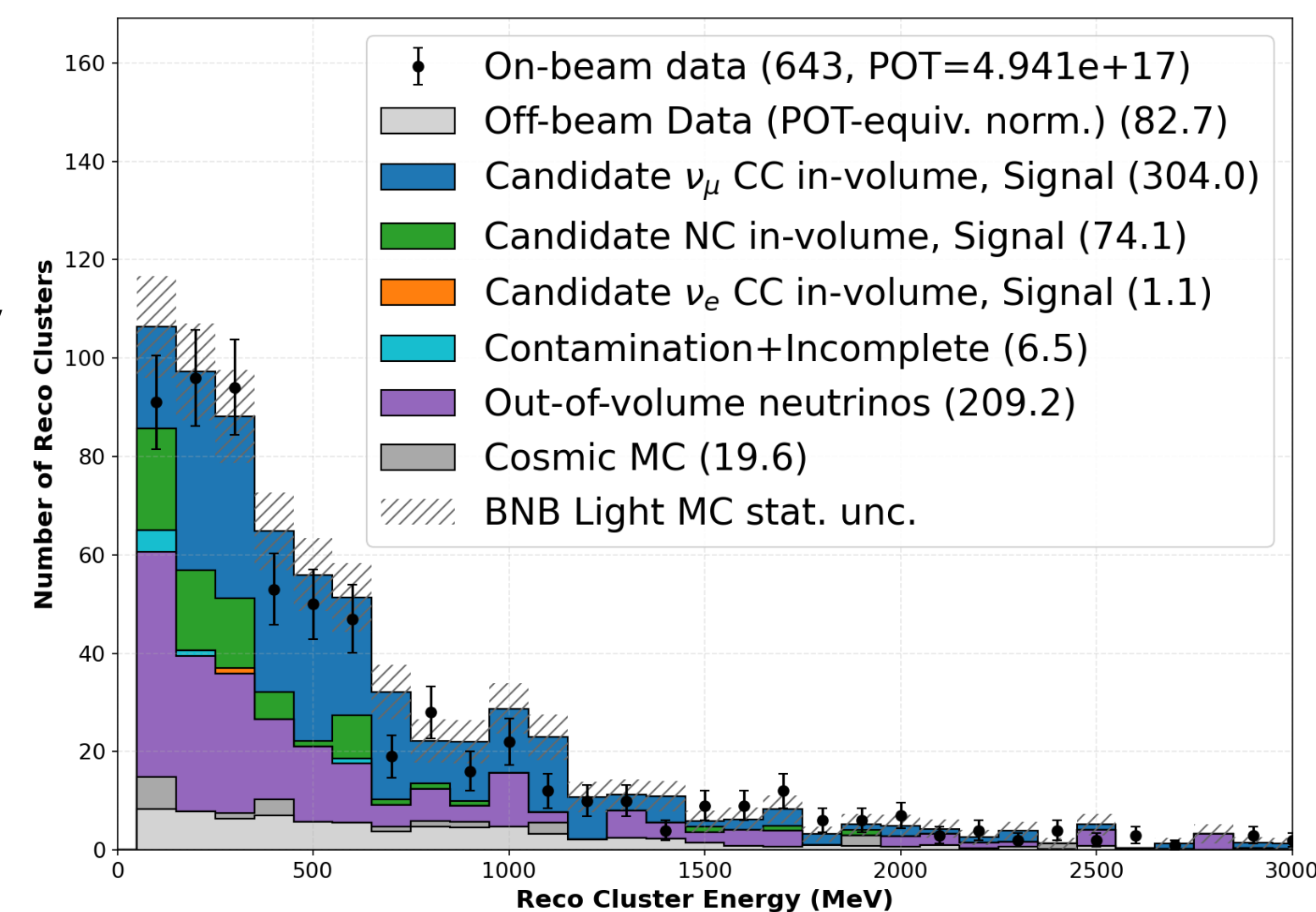
After 50 MeV cut



- It is a minor update but it shows that we are doing a very good reconstruction below 100 MeV as well



After 50 MeV cut



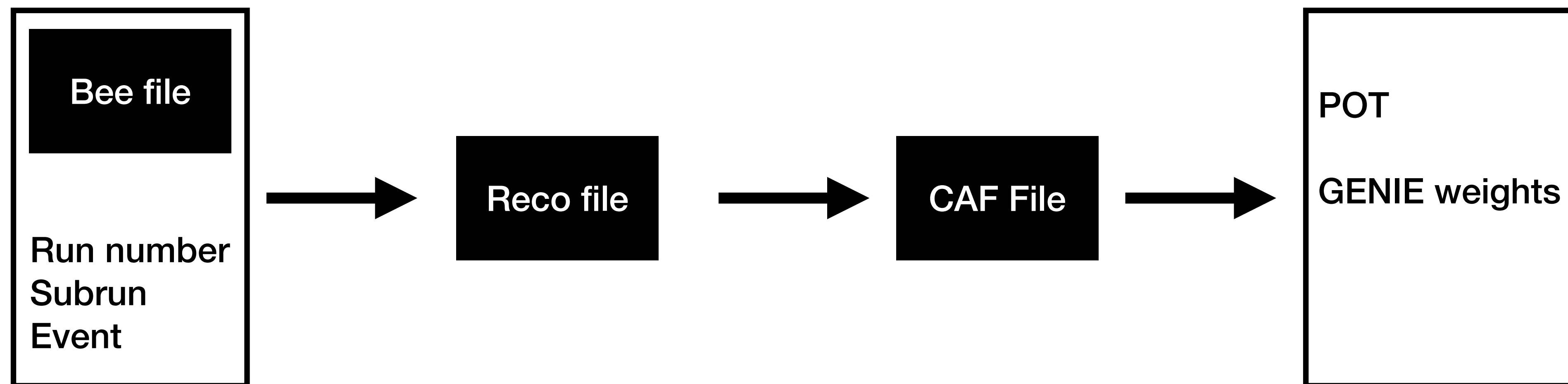
- Challenging part is below 50 MeV

Next Plans

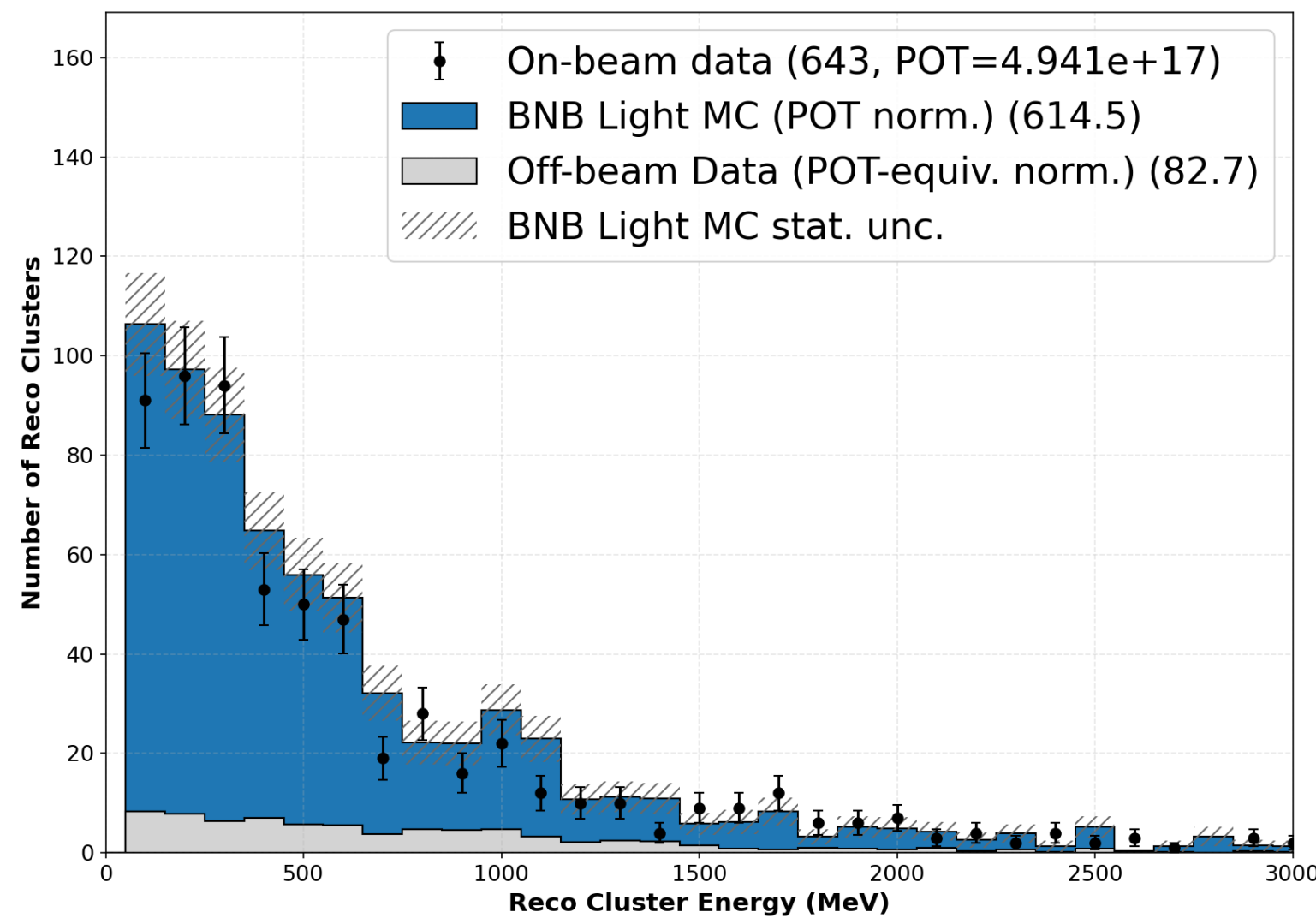
- A first look at GENIE weights
- Validate root files produced at first stage
- Move ahead to ν_{μ} CC selections using PR information

Next Plans: A first look at GENIE weights

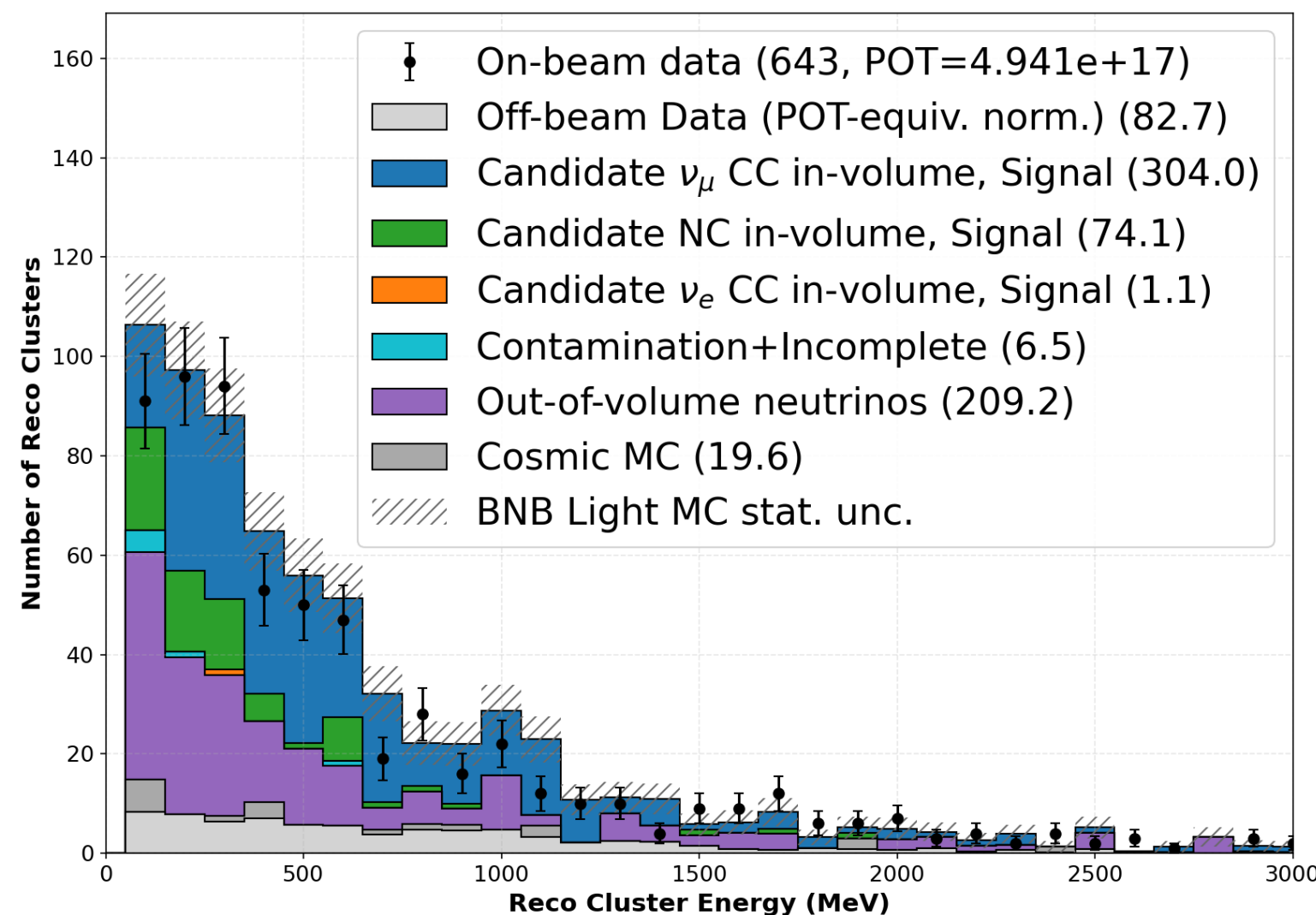
- In bee files we do not save GENIE weights but at final physics analysis we will need to apply them
- My plan is to get GENIE weights from CAF file to have a look at them
- I already developed a successful framework to evaluate POT which can be used for GENIE weights as well



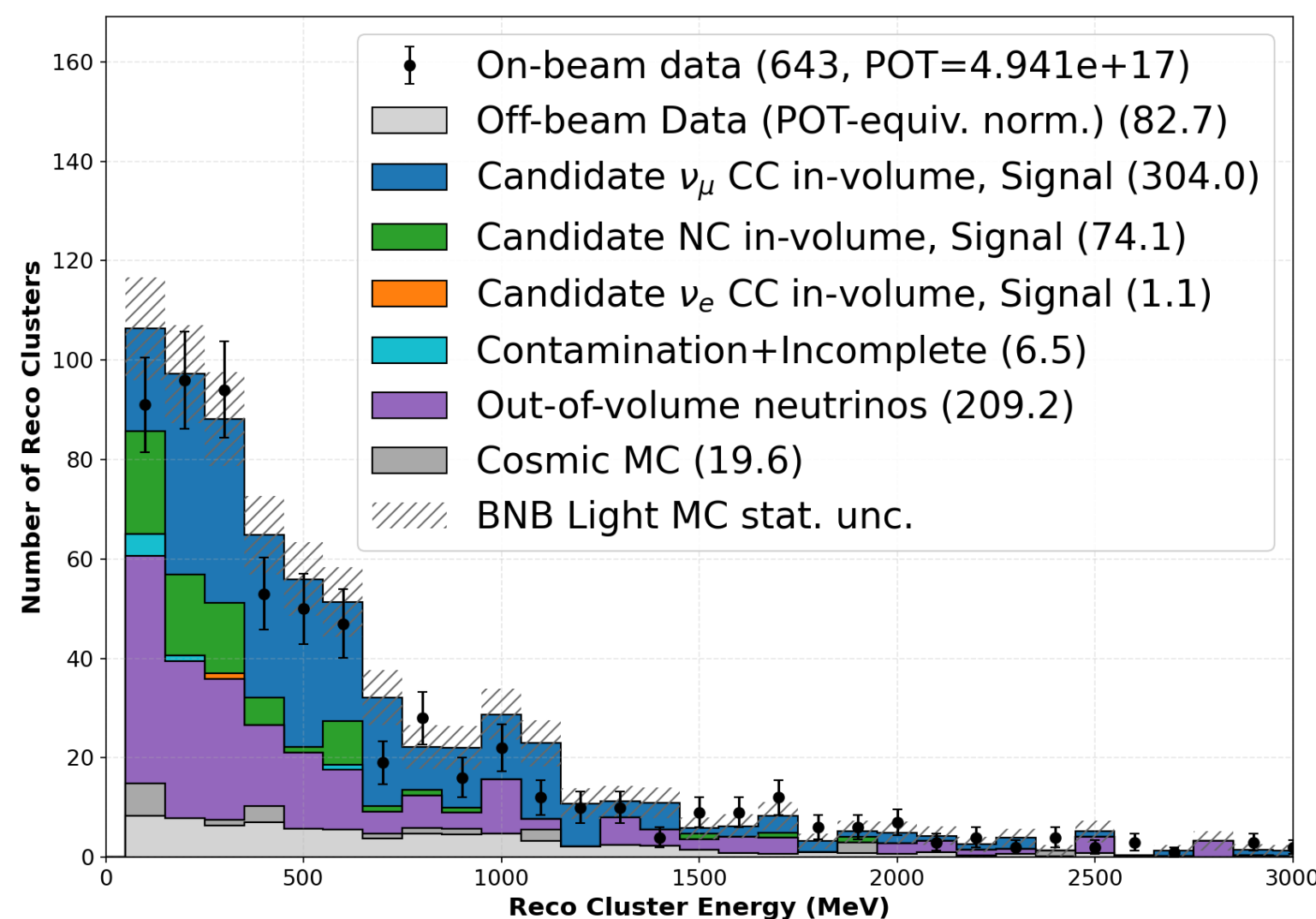
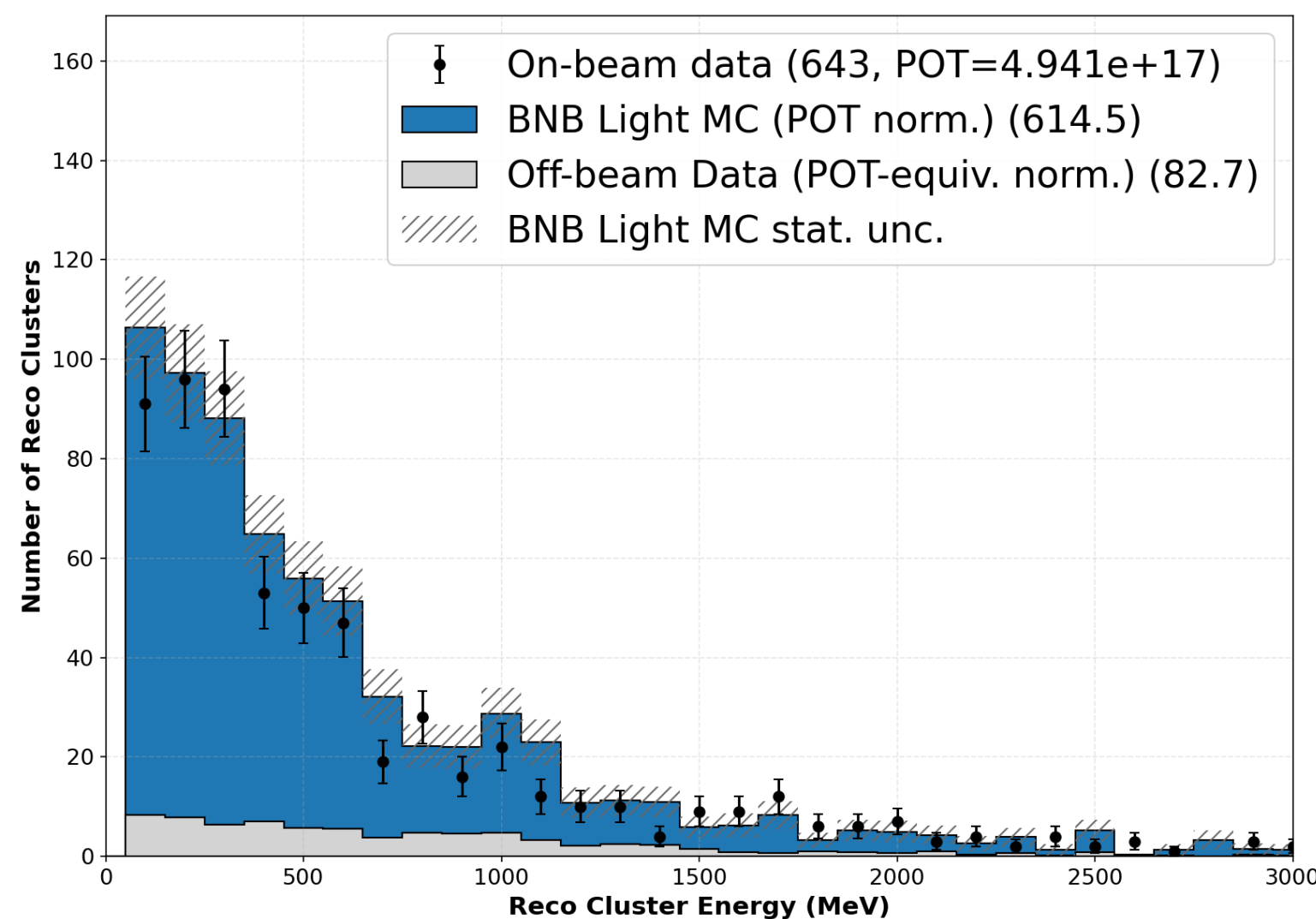
Next Plans: Validate root files produced at first stage



- These plots were made using bee json files
- Haiwang also produces root files at the end of first stage along with json files. These root files will be input to the second stage of wirecell reconstruction
- I can remake these plots using those root files to validate that they can reproduce same results



Next Plans: ν_μ CC selections using PR information



- First stage is the generic neutrino selections to inclusively select $\nu_\mu CC$, $\nu_e CC$, and NC interactions
- Next plan if to move to the second stage to use PR information to focus on inclusive $\nu_\mu CC$ selections
- Additionally, the PR information will also help us to further remove:
 - Out of volume neutrinos
 - Cosmic-muons

Backup