

Front End Chicane Parameters

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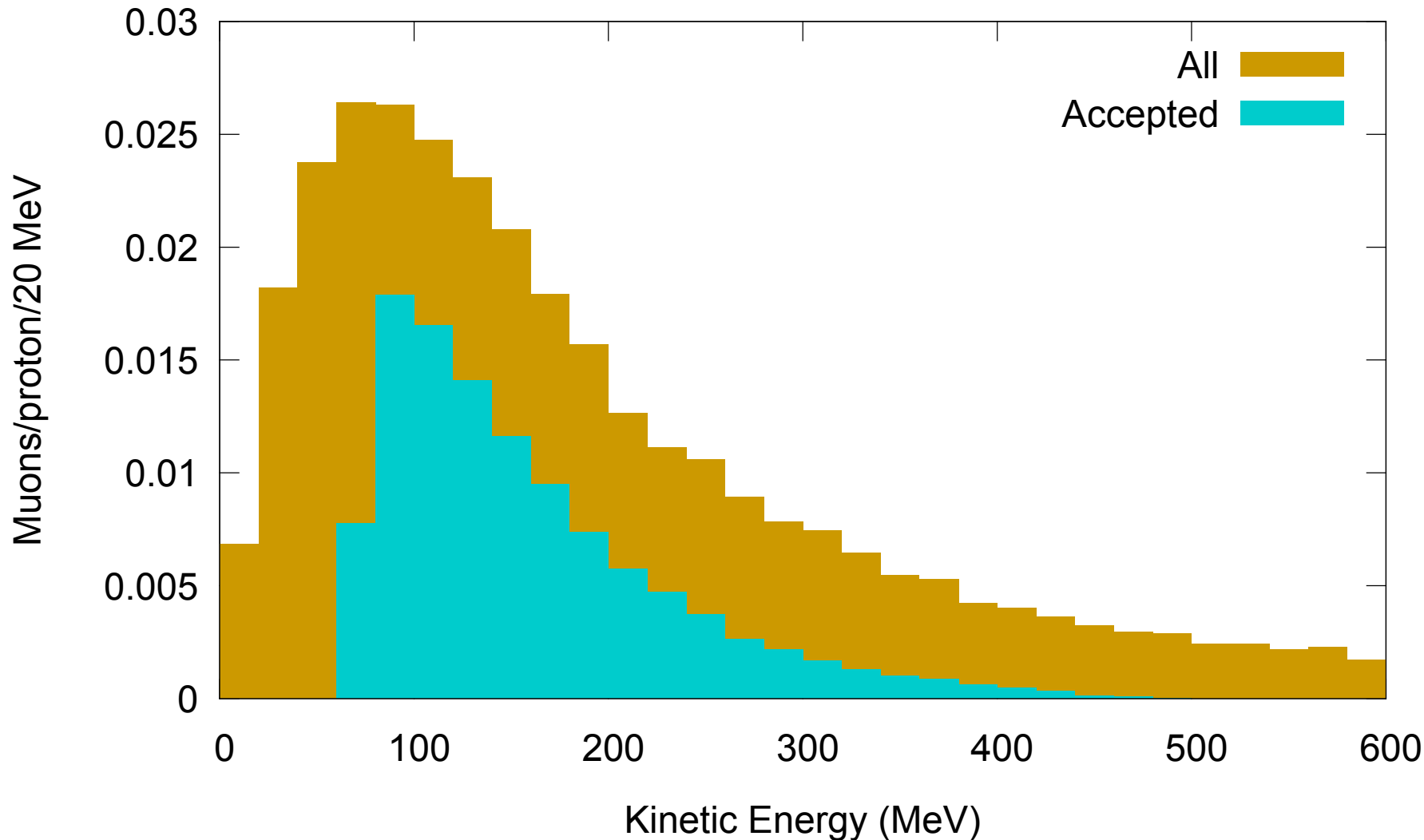
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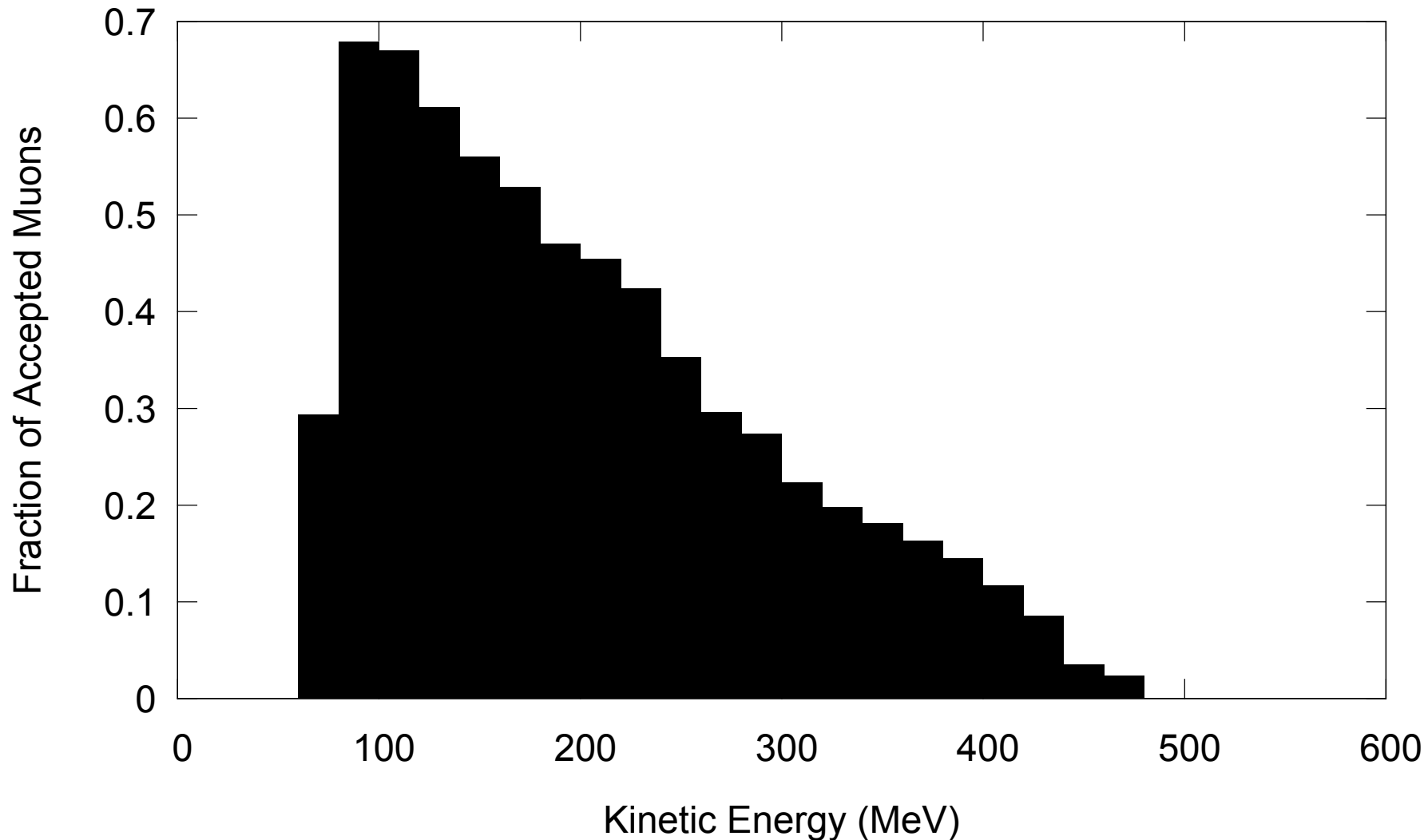
BNL Muon Accelerator Group Meeting

27 March 2014

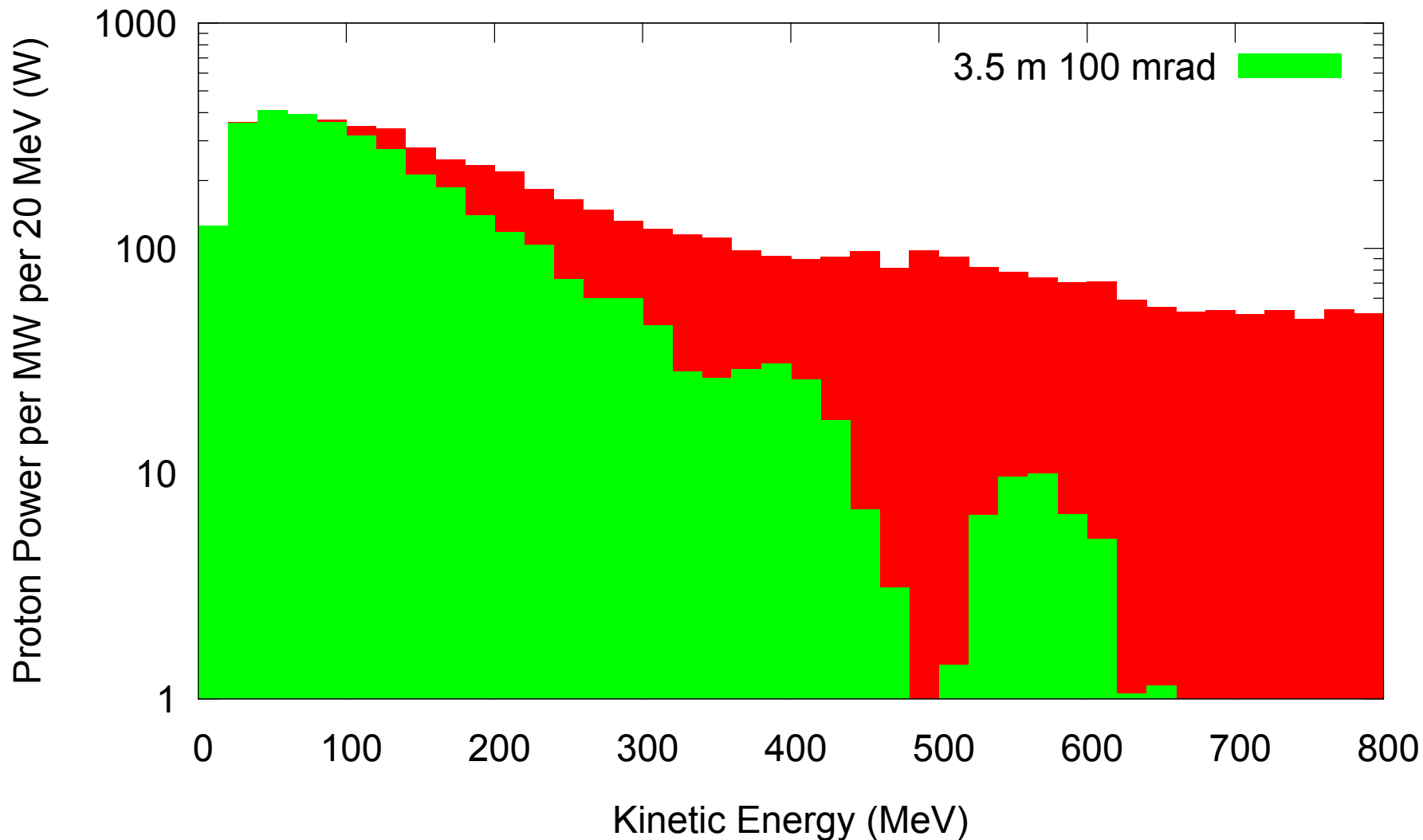
- Goal: optimize chicane parameters for high energy cutoff
- Not dealing with absorber for low energy protons
- Chicane field is 2 T
 - Could be done for other fields
- 25 cm radius aperture downstream of chicane
 - No aperture in chicane
- Scanned in chicane length and angle

- Look at fraction of muons at end of chicane that are captured in cooling
 - Depends on absorber thickness
 - Also depends on NBPR design
 - Also did for pions
- Call “transmission” muons within 80–260 MeV kinetic energy, pions 80–320 MeV
- Initially looked at proton power downstream
- Decided better criterion was energy beyond which all protons were lost
 - Came up with designs that removed more proton energy, but left many high energy protons.



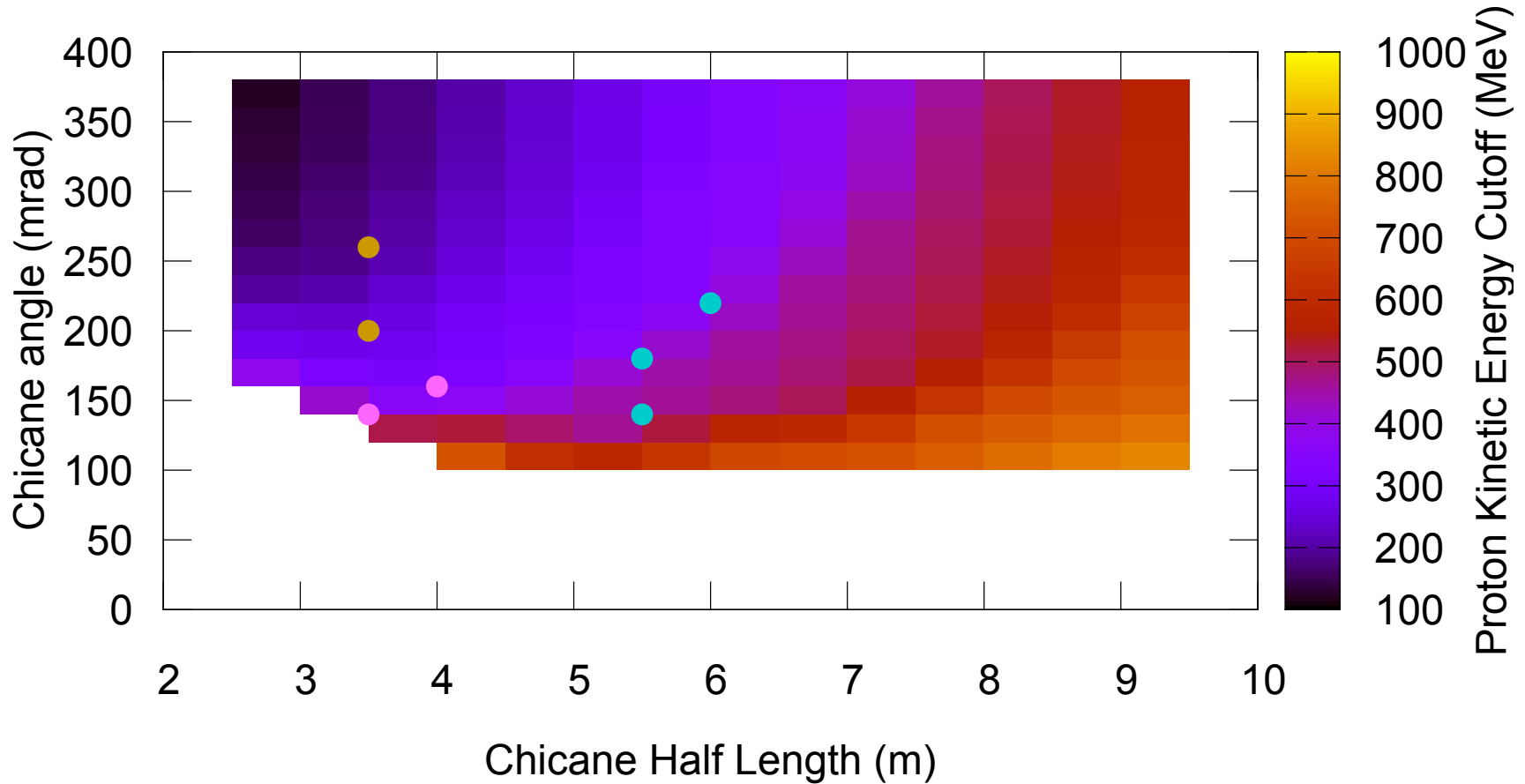


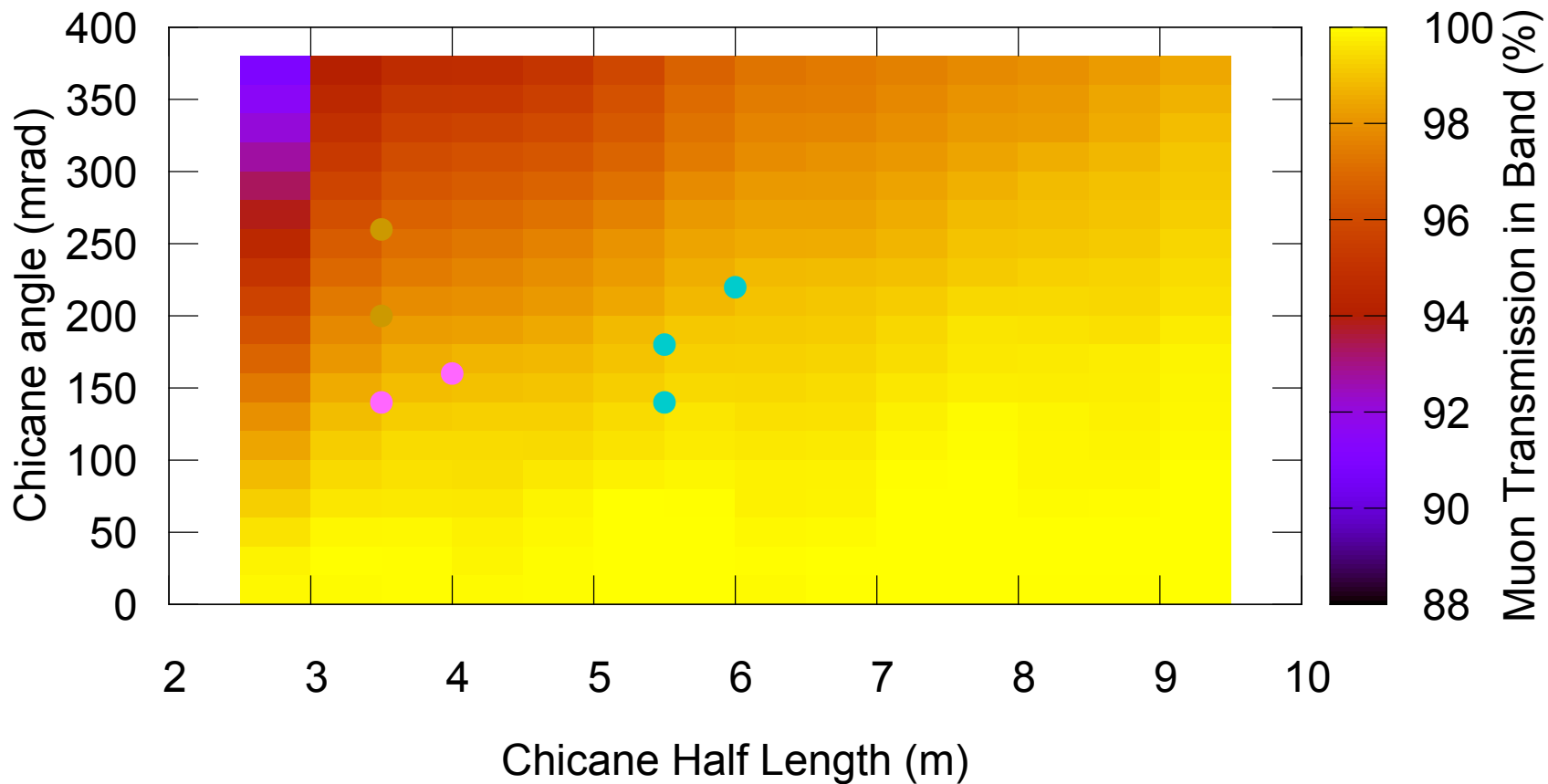
Performance Parameters

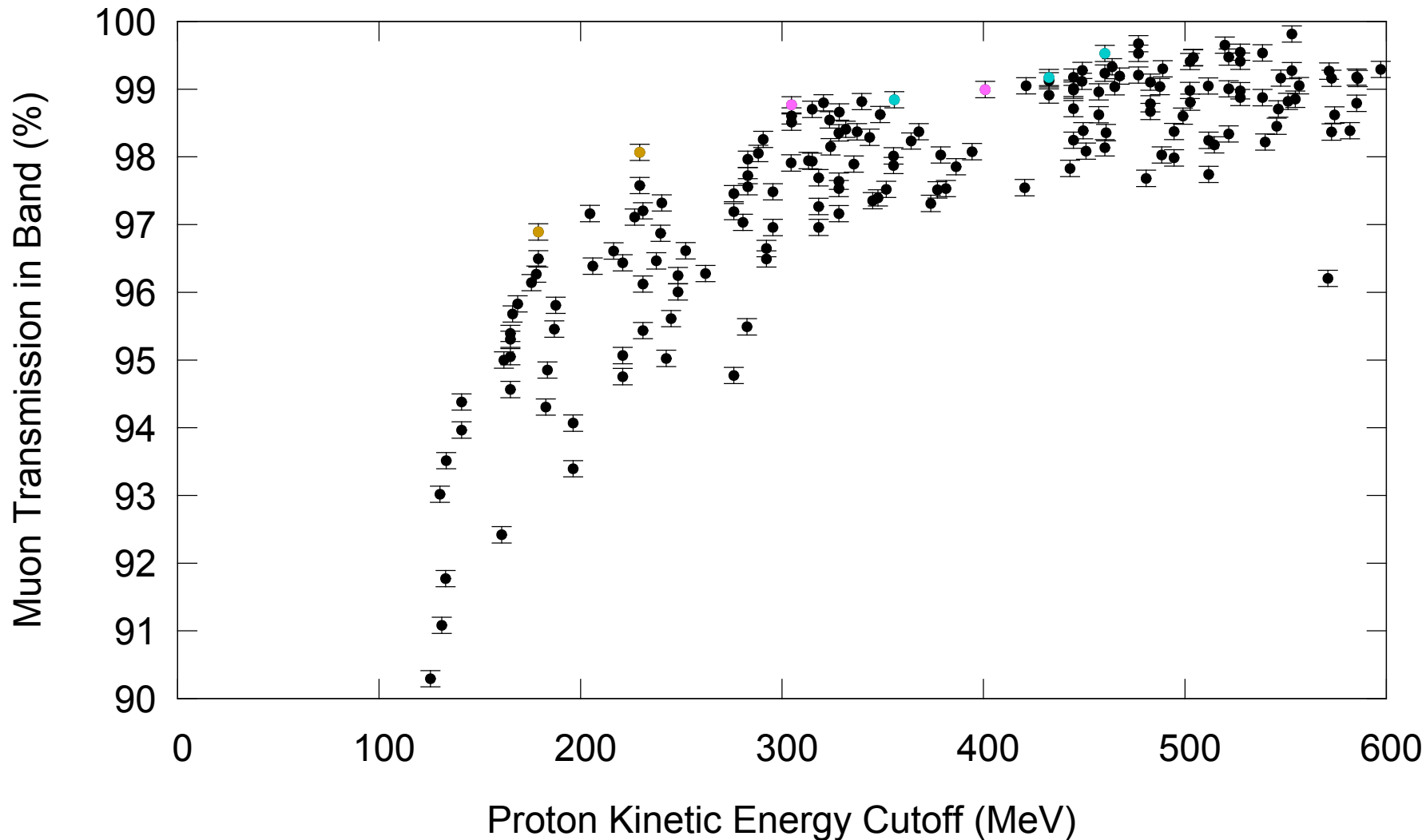


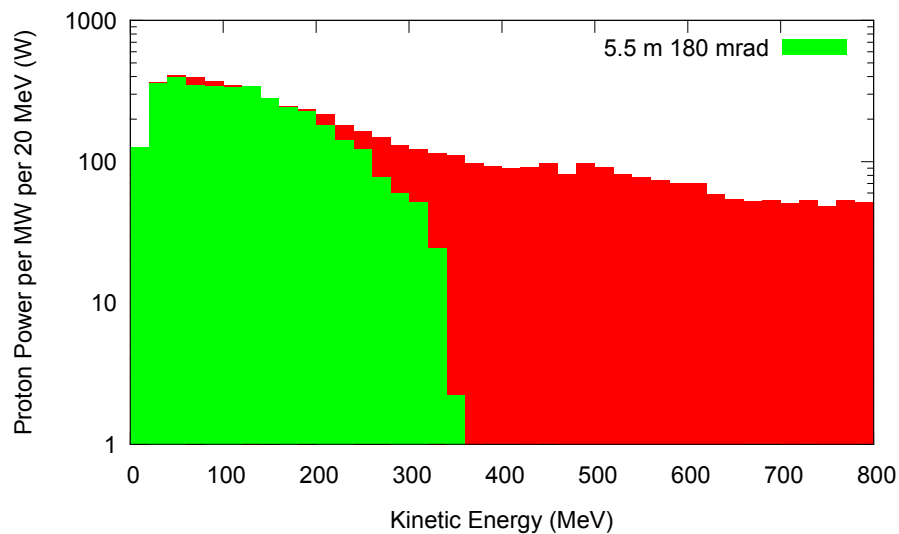
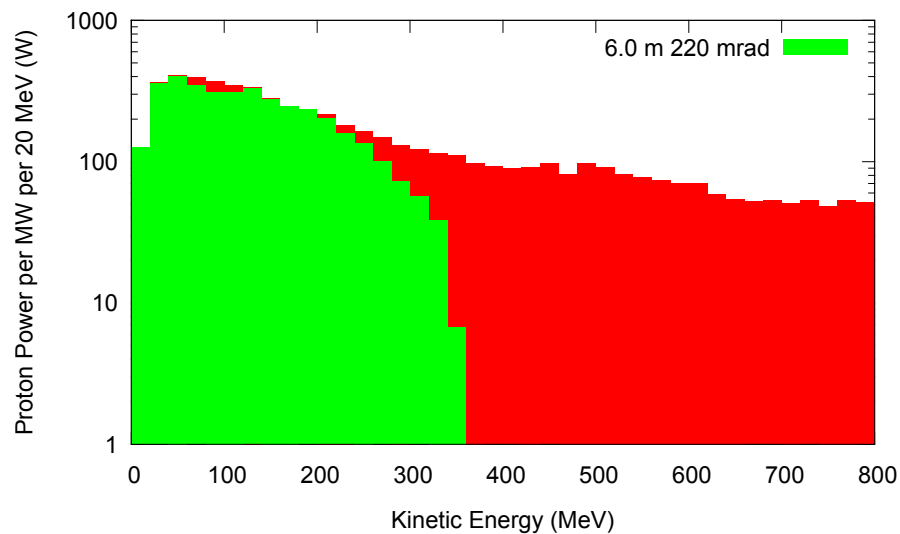
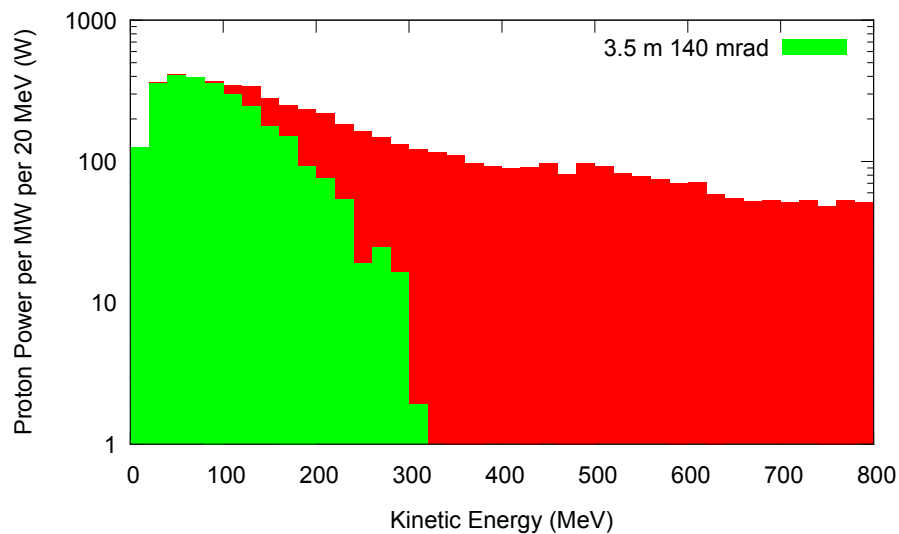
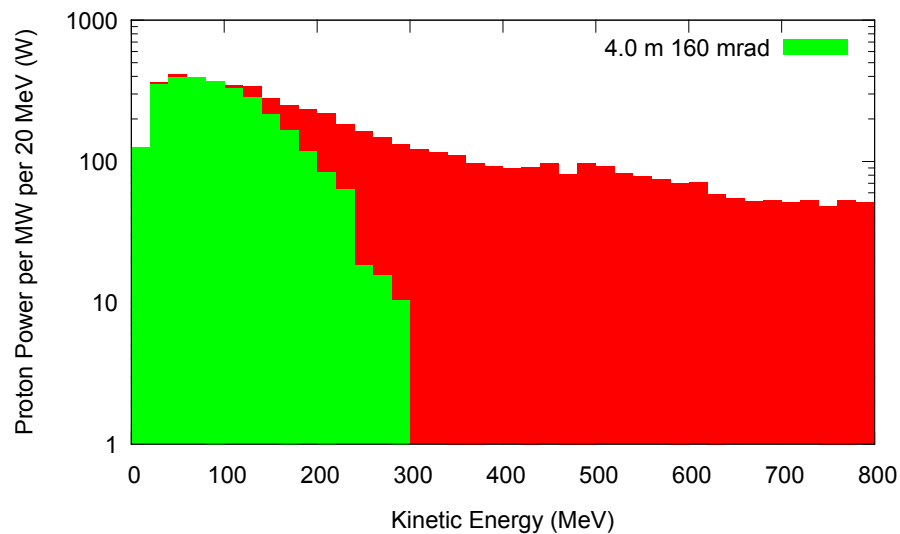
- Can find solutions with best transmission for a given proton energy cutoff
- For higher proton energy cutoffs, two sets of optimal solutions
 - One for shorter chicanes, but look less robust
 - One for longer chicanes
 - Need to analyze these a bit more
 - Optimal clearer for lower proton energy cutoffs
- Some cutoffs appear lower than I say
 - Cutoff can be determined by a single proton
 - Working on criterion of integrated power

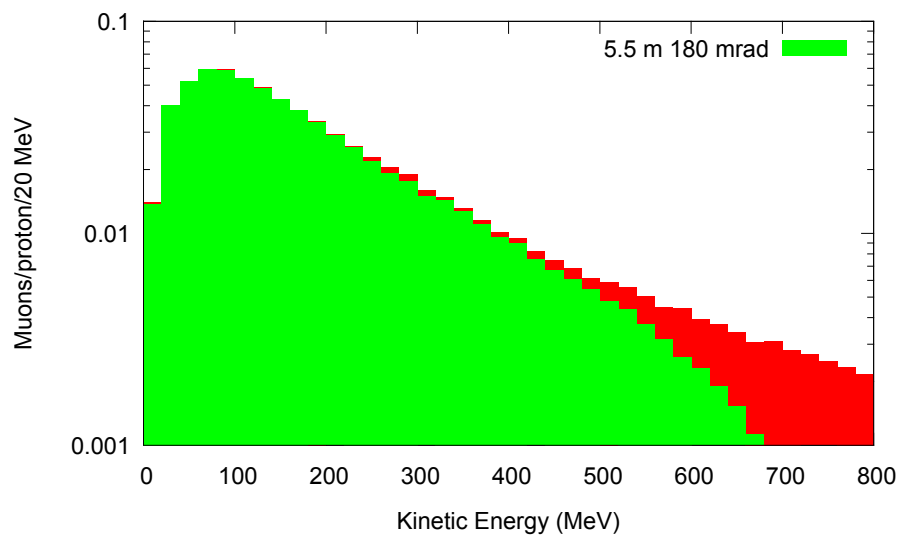
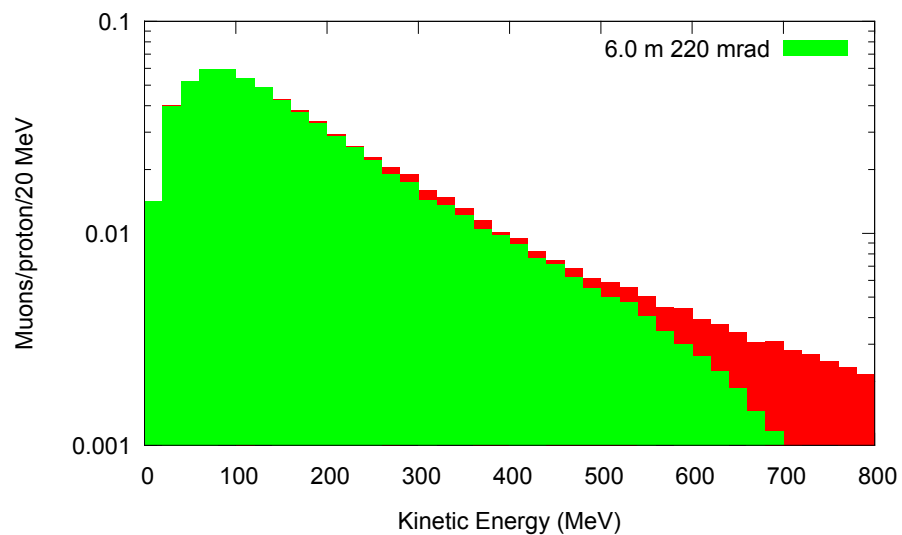
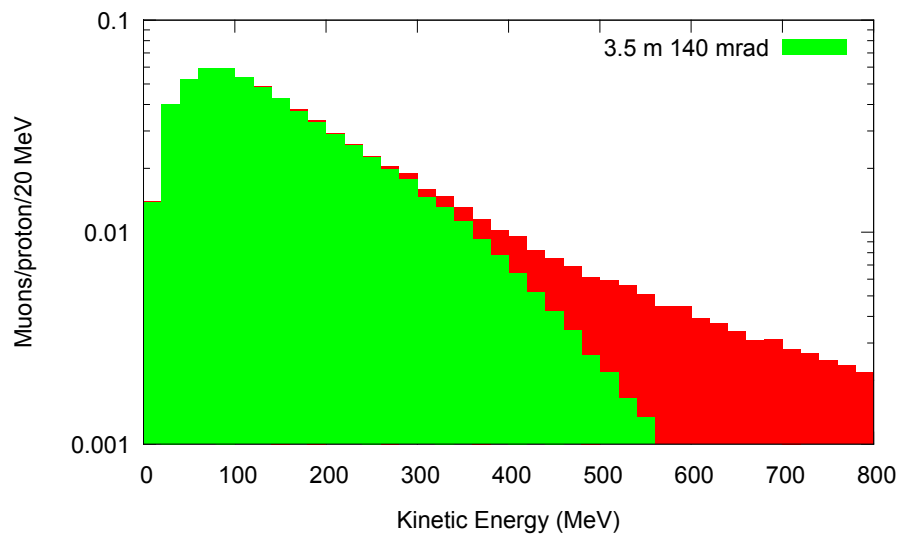
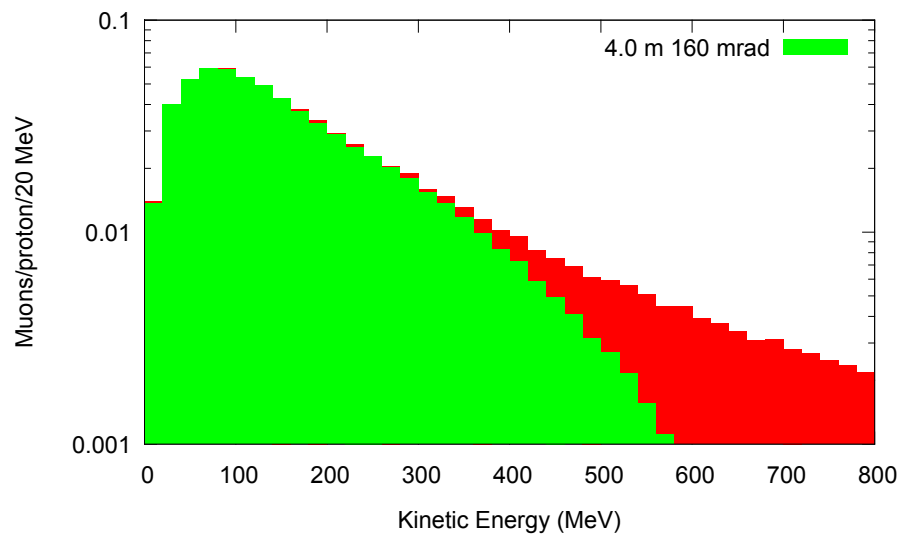
Results











- Can find best solutions (in terms of muon transmission) for various proton energy cutoffs
- Best cutoff will depend on downstream details
 - Lower cutoff energy requires less absorber
 - But some loss in muon transmission
 - More than indicated here: higher energy muons also transmitted
- Will need to optimize full system
- Need to understand best parameter regime
- Could look at other fields
- Could pass distributions at end of chicane to G4beamline