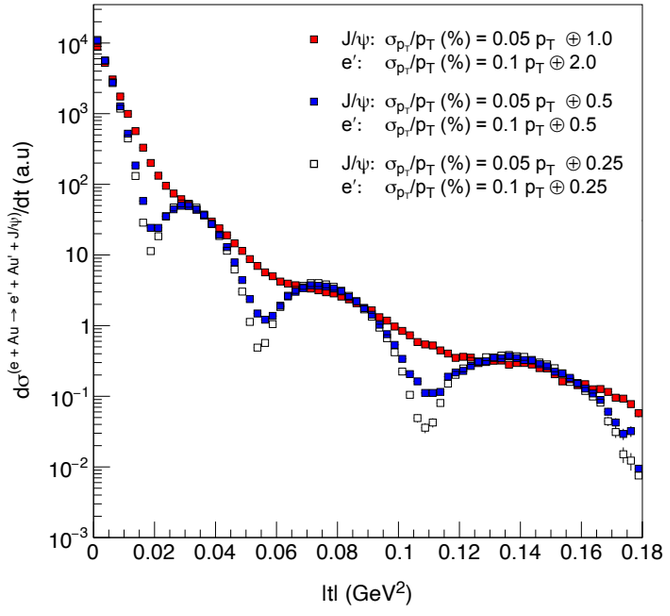
exclusive J/ψ update

Peter Steinberg / ECCE exclusive reactions meeting / 28 May 2021

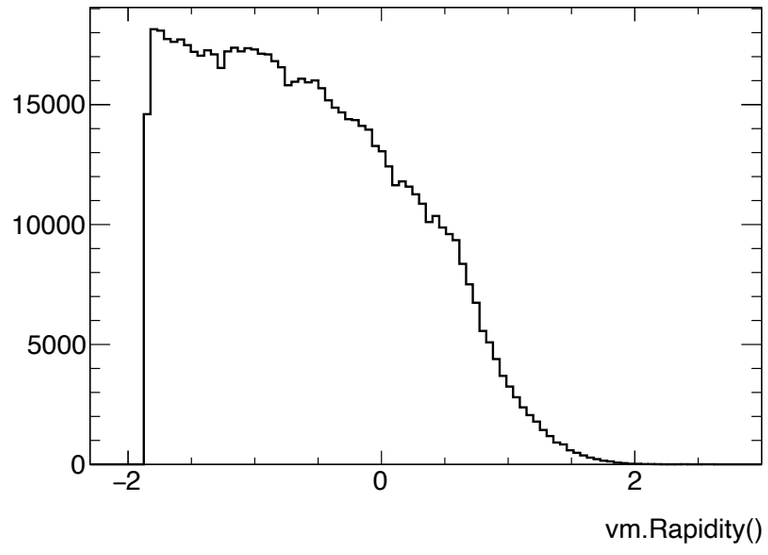
exclusive J/psi in sartre

goals: 1.4T vs. 3T, rejecting incoherent using FF detectors



- **Extensive discussion with a growing group**
  - Barak Schmookler - has a working version of 1.33 on SDCC, with a few sample files
  - Thomas Ullrich (author) - recommends 1.34 (from svn head)
  - Tobias Toll (author) - validating new tables
  - Mark Baker (BeAGLE author) - coordinating new table production
  - Vasily Morosov (IP8 designer, sartre user?) - developed new tables with better binning, fixing some artifacts found in 2017/2018
- **I was able to run on my laptop until upgrading to Big Sur**
  - Now having a strange root problem - will keep trying
- **Now using a sample of 1M input e+A (10x110 GeV), filtered on coherent (since we can't simulated ions yet…)**
  - Also Mark suggests we use Beagle for incoherent due to the better Fluka simulations which contain decay photons
  - Also poor handling of excitation energy (MDB)
- **Found a weird artifact in sartre - sharp cutoff in J/psi rapidity**
  - Not sure where this is configured, or if it's a limit of the tables used - checking with authors

J/psi rapidity from Sartre



Simulation status

- **I have a simple chain running on BNL SDCC farm**
  - just photo production for now (no need for forward lepton measurement)
  - sartre text file -> EIC smear tree -> fun4all -> event_tree
- **One big issue: fun4all was not tracking the ion in G4**
  - Turns out the HEPMC input was not handling the ions properly
  - Should be fixed ~today
- **It's awkward but works**
  - I have processed 10k Jpsi->ee for 1.4T and 3T
  - So far 1.4T and 3T are not so different - most tracks are in the central region, so less sensitive to the forward field
  - However one major issue: electrons radiate in the tracker, distorting the pT and thus the measured t
  - How were we planning to handle this in ECCE?
- **TBD**
  - Need Q^2 measured to get t when $Q^2>1$ GeV^2
  - What is the general plan in ECCE for electron reconstruction and DIS kinematics?