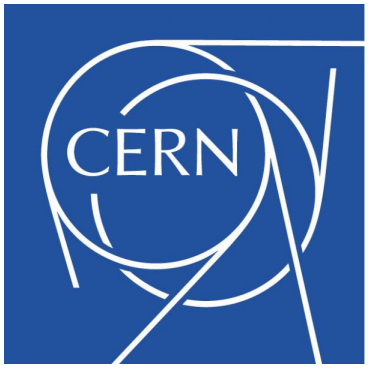


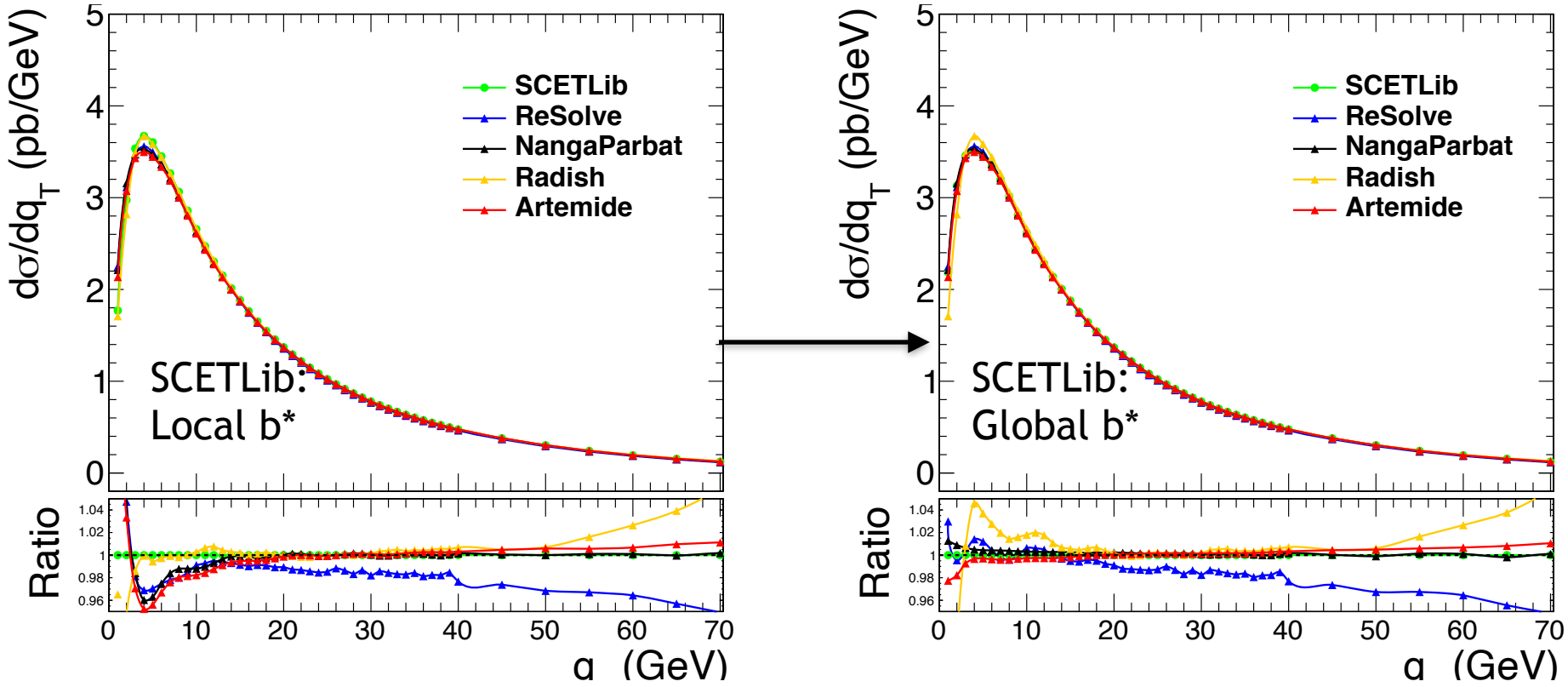
Resummation benchmarking

LHC EW precision group workshop

June 3, 2020

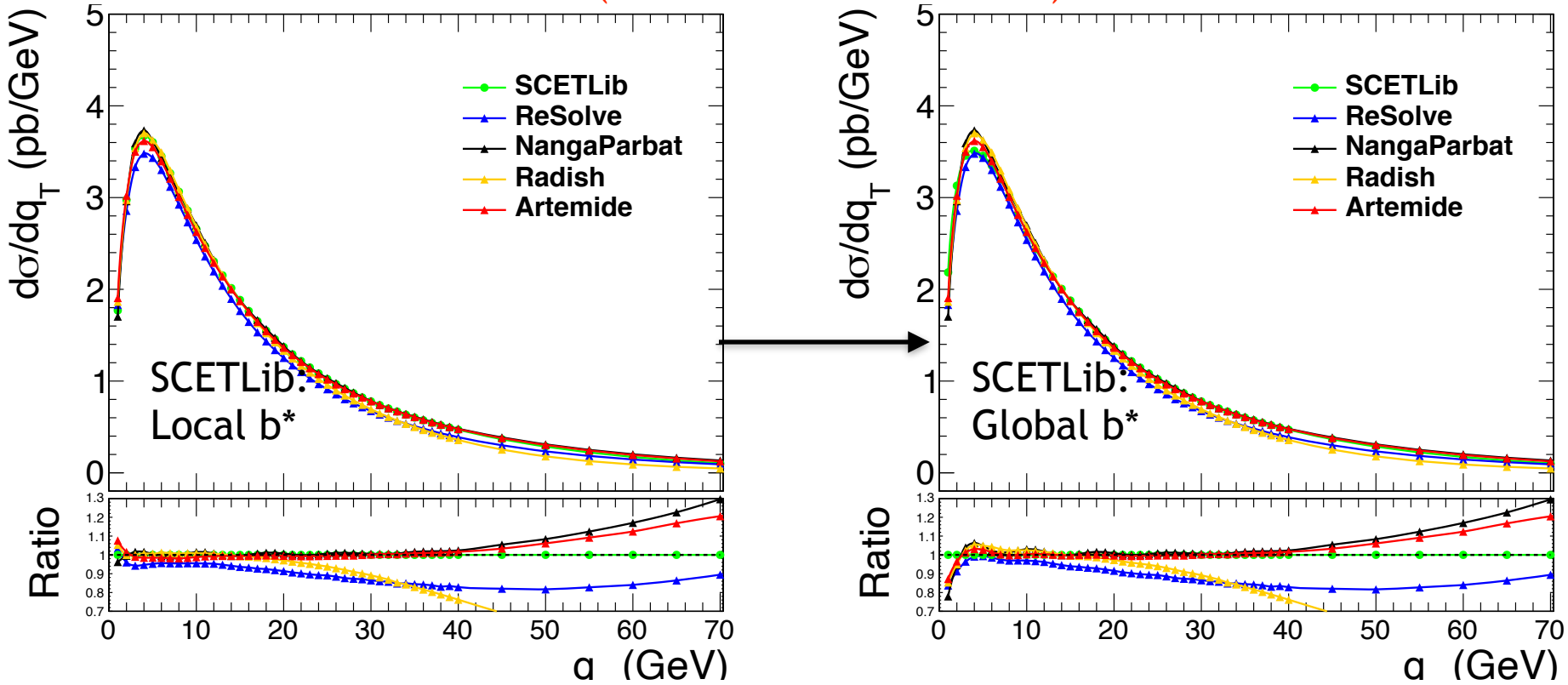
Level-1 benchmarking

- First step of benchmarking has been quite successful
  - ReSolve, NangaParbat, DYTurbo, Radish, SCETlib and Artemide
  - Demonstrated that low qT (<10GeV) differences for b-space calculations are due to Landau-pole regularization procedure



Level-2 benchmarking

- Level-2 benchmarking
  - Inclusion of modified logs
  - Different codes use their 'nominal' settings
    - e.g. favorite Landau pole regularization (left plot)
    - Resummation scale: (mZ/2 for radish/resolve)->scale uncertainties



Leve-2 benchmarking input status

- Systematic uncertainties become relevant for this step
  - Perturbative uncertainties (μR/μF and resummation scales)
- Status of the inputs:
  - Radish and NangaParbat have provided all the variations separately
  - Aretmide has provided the overall uncertainty band
  - Resolve, SCETLib to provide the uncertainties on git
  - DYTurbo to provide the the Level-2 predictions and uncertainties
- Level 3 benchmarking: Matching to fixed order
  - DYTURBO can provide V+jet predictions at NLO with fixed binning that can be used for the benchmarking by all groups