

TECHQM: Hard WG

- “Vision” of working group:
 - Work on two parallel tracks:
 1. Address problem of improving understanding of theoretical issues in energy loss calculations.
 2. While developing a program of systematic tests of energy loss calculations with realistic media.
 - For item #1, go back to simplest problem (“brick”)
 - Then work our way to more complicated/realistic problems
 - For item #2, take advantage of results that will come out of the Collective Motion working group.
 - Realistic media \equiv Hydrodynamics (full evolution)
 - When we are done, will have understood energy loss evaluated with best available medium (for $\tau > \tau_0$).
- Have defined two problems to tackle.

Problem A: Standard (QGP) Brick

- Goal
 - Map out dependence of energy loss calculations on parameters using simplest geometry.
 - Determine mapping of parameters between models.
- Problem:
 - Fixed length “brick” of length 2, 5 fm.
 - Quark energies 10 GeV, 100 GeV.
 - Virtuality $Q^2=E^2$ where possible.
 - Produce $P(\Delta E)$ for different values of parameter(s).
 - Provide function to map parameters to energy density.
 - Assuming purely thermal QGP
- Empirically match $P(\Delta E)$ from different models
 - “Blind” evaluation of resulting energy densities.

Problem B: Hydro, jet from center

- Goal
 - Test how different models handle a realistic time, position-dependent medium with simple jet geometry.
 - Evaluate consequences of different Hydro calculations.
- Problem:
 - Using standard format for Hydro output defined by Steffan & Collective Motion working group.
 - Quark and gluon jets at 10, 25, 100 GeV.
 - Produced at $(t,x,y,z) = (0,0,0,0)$ in $b=0$, 200 GeV Au+Au
 - With virtuality $Q^2=E^2$ (where possible).
 - Produce $P(\Delta E)$ distribution.
- Directly compare results for $P(\Delta E)$.