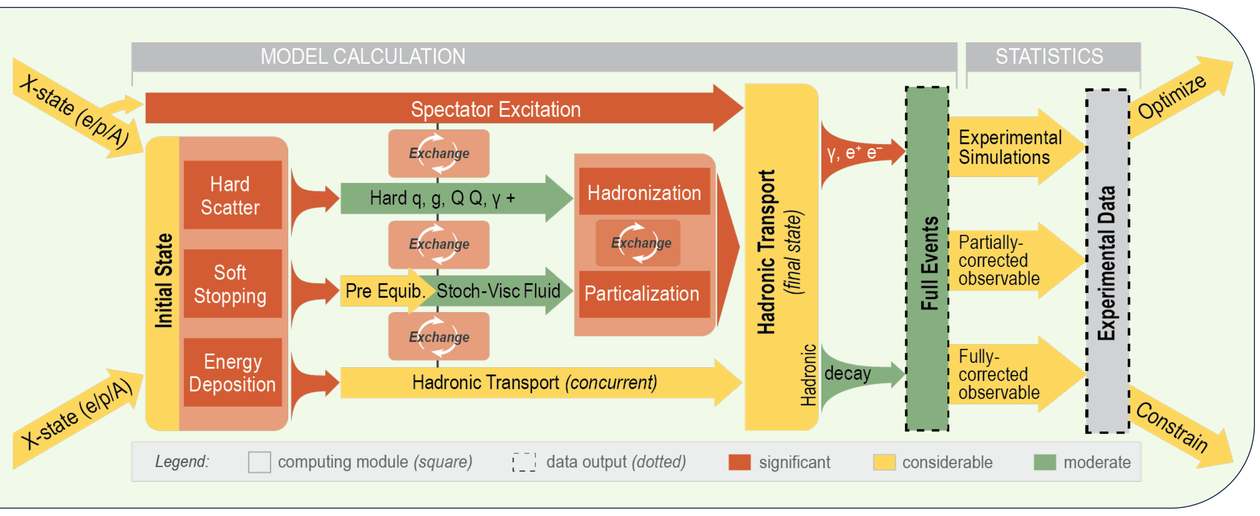
Jets and high-p_T probes in Small Systems using a Multistage Framework

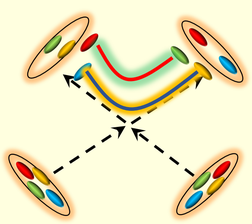
Abhijit Majumder for the JETSCAPE Collaboration

New X-SCAPE 1.0 framework

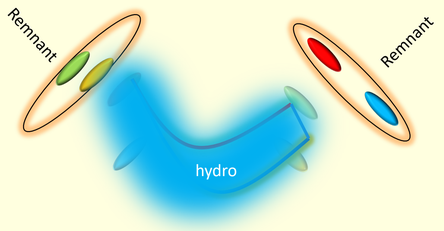
- A new framework that allows more flexibility
- Time can go backwards and forwards !
- Backward evolution allows for ISR.
- Can be run with any number of modules.
- Allows Energy momentum conservation
- Backwards compatible with JETSCAPE



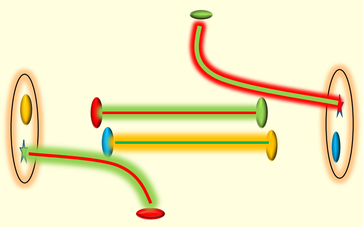
3D Glauber + MUSIC



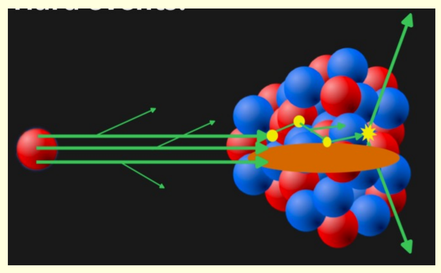
- Nucleons have multiple hot spots within them.
- Strings connect pairs of hot spots
- String 4-momentum and baryon density seeds hydro
- Remnants go down beam line.



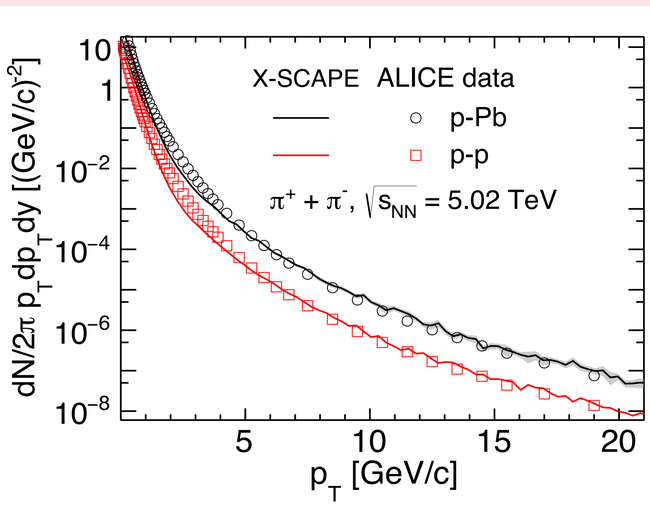
3D Glauber + MUSIC + I-MATTER + PYTHIA + MATTER

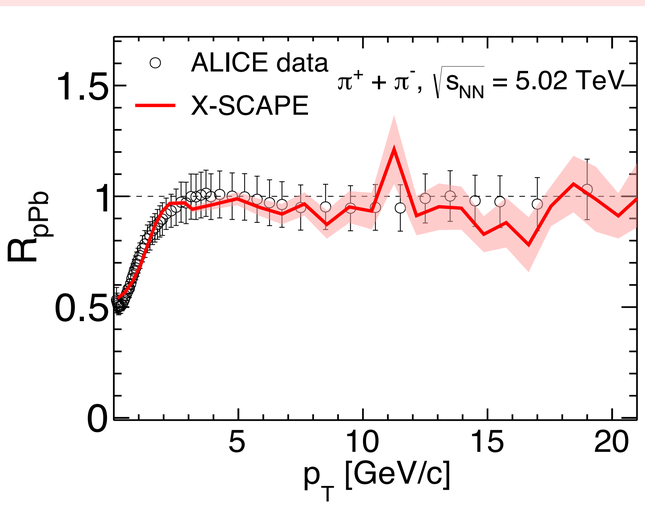


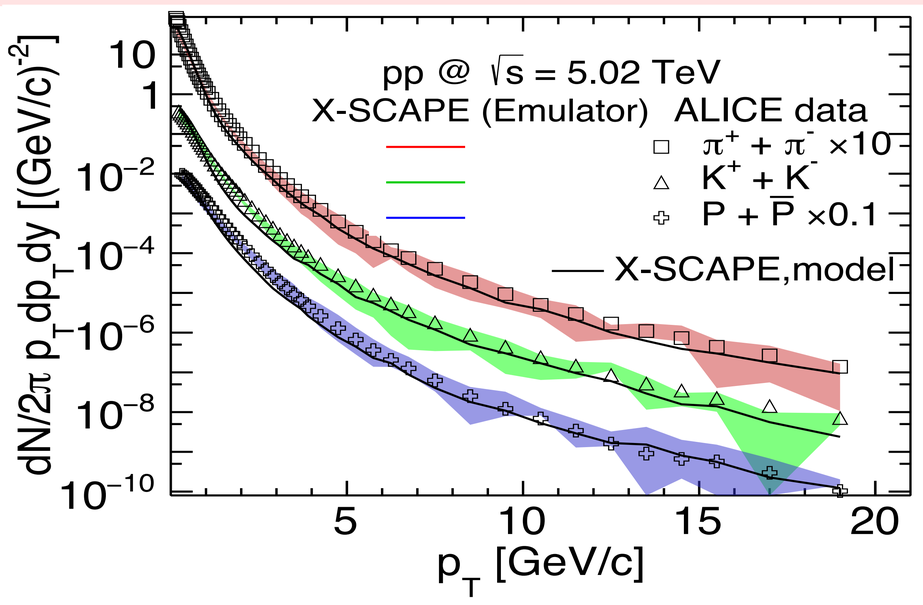
- Hard initial state partons from a hot spot
- Hard partons scatter (PYTHIA)
- with ISR (i-MATTER) and FSR (MATTER).
- ***Hard energy removed from nucleons,***
- Strings get pulled out by hard partons, fragmented by string breaking
- Strings that don't get pulled, liquified into a fluid
- Fluid evolves and produces particles

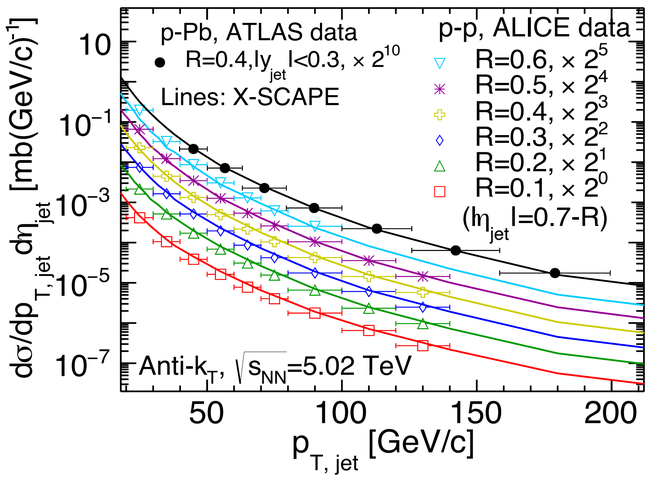


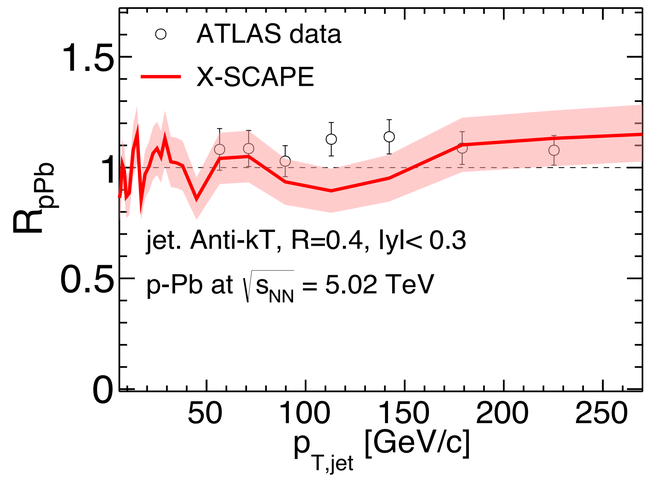
Results: Merging simulations without jets and with jets using $\hat{p}_T \geq 6\ GeV$

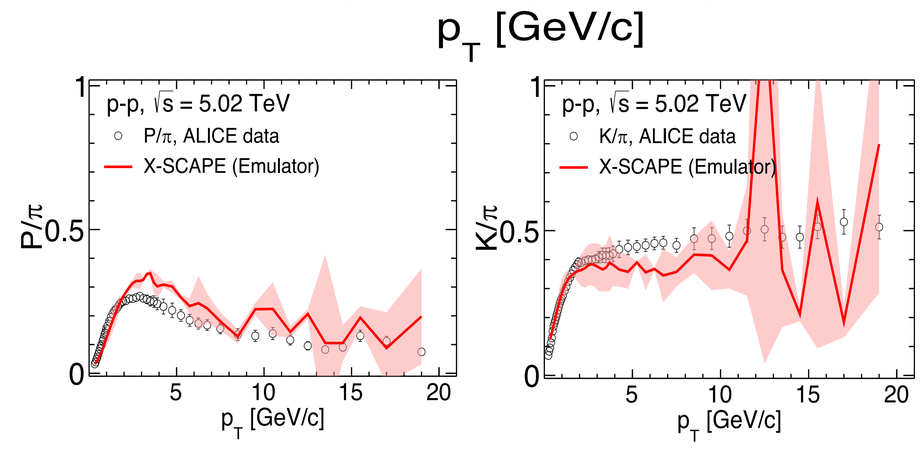












Bayesian calibration being carried out. Preliminary results explain π, K, p and jets in p-p and p-A

- Universal small and large system framework allowing a hard and soft component in p-p, p-A, and A-A.
- Has built in explicit energy-momentum conservation between hard and soft sectors of a collision.
- XSCAPE-2.0 will be focused on Beam Energy Scan, XSCAPE-3.0 on parton energy loss in e-A.

U.S. DEPARTMENT OF ENERGY
Office of Science
NSF