

Pion Production Cross-section Measurements in p+C Collisions at the CERN SPS for Understanding Extensive Air Showers

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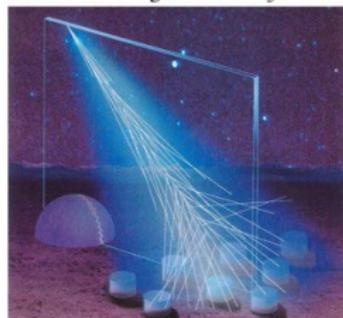
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Studies of Extensive Air Showers

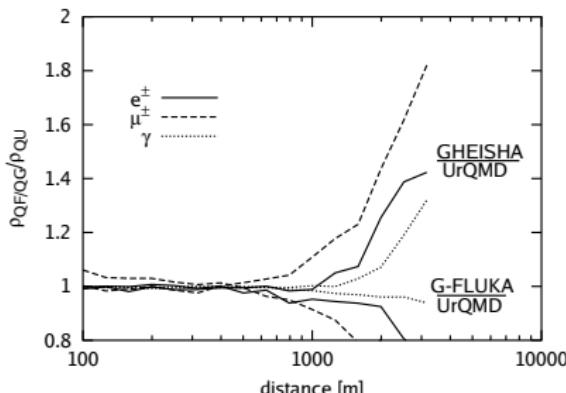


Pierre Auger Observatory



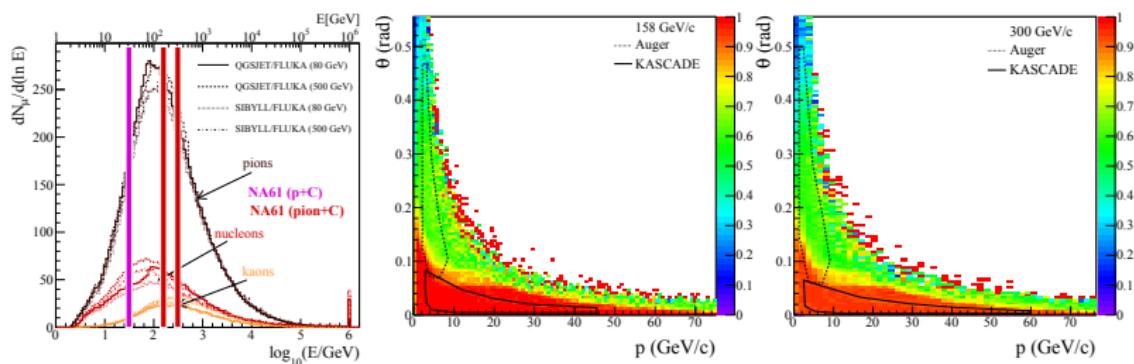
- Way of studying high-energy cosmic rays
- Surface arrays, fluorescence telescopes
- Depend on interaction models
 - several known problems
 - **tuning needed!**

Drescher et al., Astropart. Phys. (2003)



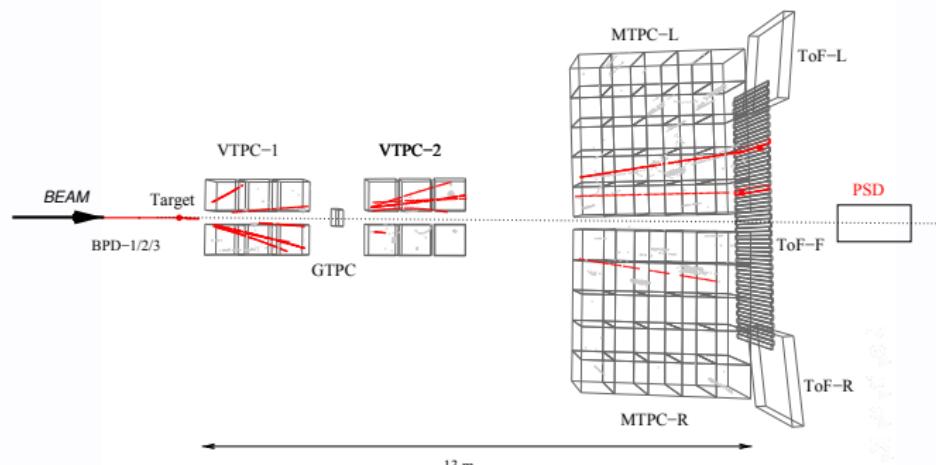
Accelerators to the Rescue

- Expected grandfather energy maximum: in the SPS range
- NA61/SHINE: good coverage of Auger, KASCADE acceptance



NA61/SHINE

- Physical goals: critical point and the onset of deconfinement, high- p_T phenomena, reference data for neutrino and cosmic-ray experiments.
- Large-acceptance hadronic spectrometer
- High momentum resolution, good particle identification

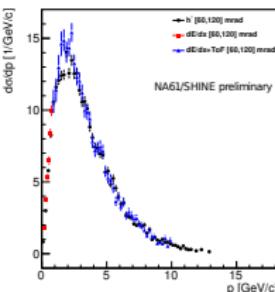
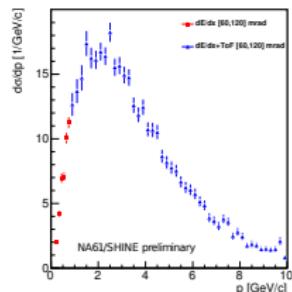
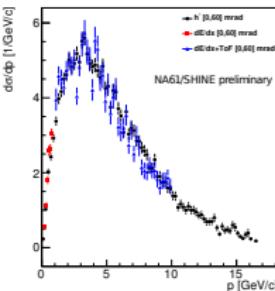
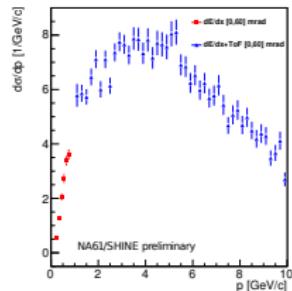


Cosmic Rays in SHINE

- $p+C$, $\pi+C$ events at 31, 158, 300 GeV
- π , K , (\bar{p}) spectra
- Three methods:
 - h^-
 - dE/dx
 - $dE/dx + \text{ToF}$



First Results



- π^\pm spectra from 2007 $p + C$ -at-31-GeV events
- Statistical errors only



Outlook

- Final 2007 results — coming soon!
- π spectra from 2009 $p+C$ -at-31-GeV data
- Other species
- $\pi+C$ systems



THANK YOU

