

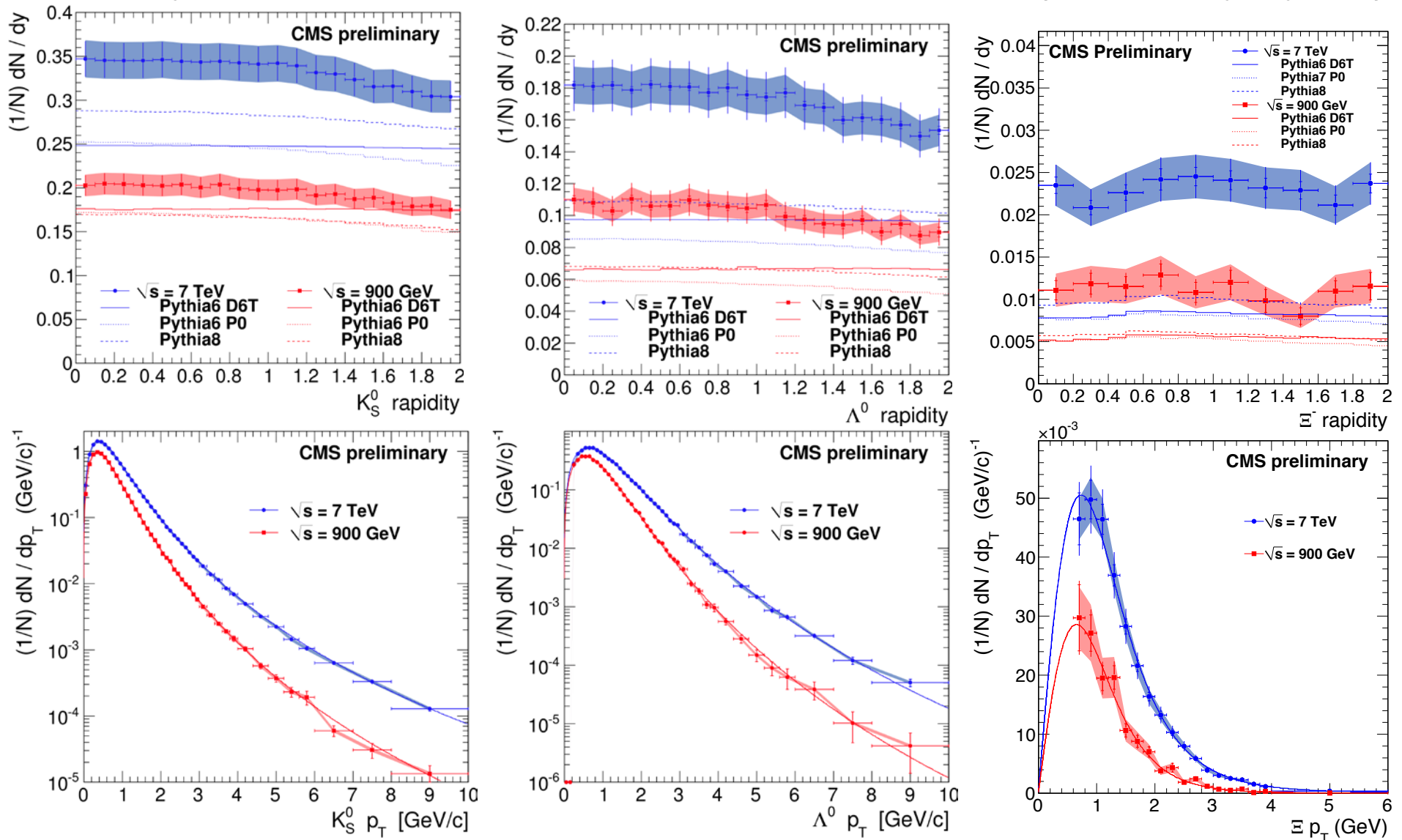


CMS work on identified particle production

Kevin Stenson
University of Colorado

ICHEP: K_S , Λ , Ξ^- production vs p_T and $|y|$

Efficiency corrected particle production per NSD event (defined by Pythia)



ICHEP: $\langle p_T \rangle$ and $dN/dy@y=0$ (compared to Pythia)

Average p_T increases with particle mass and \sqrt{s} (as expected).
 Pythia agrees at 7 TeV but is low at 900 GeV.

Particle	900 GeV		7 TeV	
	$\langle p_T \rangle$ (GeV/c) ($ y < 2$)		$\langle p_T \rangle$ (GeV/c) ($ y < 2$)	
	Data	Pythia D6T	Data	Pythia D6T
K_S	$0.657 \pm 0.002 \pm 0.038$	0.581	$0.789 \pm 0.001 \pm 0.046$	0.753
Λ	$0.849 \pm 0.004 \pm 0.076$	0.756	$1.054 \pm 0.003 \pm 0.094$	1.064
Ξ	$1.00 \pm 0.03 \pm 0.10$	0.763	$1.22 \pm 0.01 \pm 0.12$	1.167

The Pythia prediction for K_S production at 900 GeV is not too bad.
 Increasing particle strangeness, mass, or \sqrt{s} makes agreement worse.

Particle	$dN/dy@y=0(7 \text{ TeV}) / dN/dy@y=0(.9 \text{ TeV})$		$dN/dy@y=0(\text{MC})/dN/dy@y=0(\text{data})$	
	Data	Pythia	900 GeV	7 TeV
K_S	$1.71 \pm 0.02 \pm 0.20$	1.41	$0.87 \pm 0.01 \pm 0.07$	$0.72 \pm 0.01 \pm 0.06$
Λ	$1.65 \pm 0.04 \pm 0.26$	1.48	$0.60 \pm 0.01 \pm 0.07$	$0.54 \pm 0.01 \pm 0.06$
Ξ	$2.09 \pm 0.09 \pm 0.27$	1.47	$0.48 \pm 0.05 \pm 0.09$	$0.33 \pm 0.02 \pm 0.05$

Status and plans

- ICHEP results on strangeness production are available at <http://cdsweb.cern.ch/record/1279344>
 - Pythia6 D6T tune produces too few strange particles.
 - Discrepancy gets worse with increasing particle mass, particle strangeness, and \sqrt{s} . (87% of data for K_S at 900 GeV to 33% of data for Ξ^- at 7 TeV)
 - Pythia $\langle p_T \rangle$ is low at 900 GeV but good at 7 TeV.
 - Pythia6 Perugia0 and Pythia8 show similar results.
- CMS is also working on measurements of identified charged hadron production (pions, kaons, and protons) using dE/dx (momentum ~ 1 GeV/c).