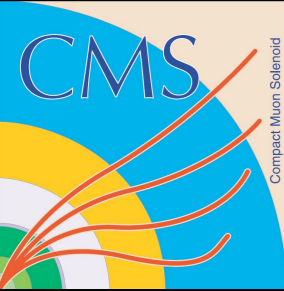


Dilepton+X LPC group

Valerie Halyo, Princeton U.
Yurii Maravin, Kansas State U.

Outline

- ▶ Overview of the group
- ▶ Integration and impact on CMS and US CMS
 - Commissioning physics objects
 - Data analysis tools
- ▶ Overview of physics analysis program




Dilepton group tasks



- ▶ Form a discussion forum that concentrates on topics common to physics with two or more leptons in the final state
 - Data analysis tools (PAT), access and analysis
 - Electrons, muons, taus
 - Reconstruction, identification, commissioning
- ▶ Enhance contribution to CMS physics and commissioning
 - Physics analyses groups (PAG)
 - Detector performance and physics oriented groups (DPG and POG)
- ▶ Link graduate students to senior scientists, invite theorists and phenomenologists to give talks, link to Tevatron

Dilepton meetings

- ▶ Bi-weekly group meetings (alternate with Physics Forum)
 - Low mass resonances: Y and J/Ψ
 - High mass resonances, New Phenomena: Z , Z' , W' , TC, Diboson
 - Theory and phenomenology: Nima Arkani-Hamed, James Wells
- ▶ Workshops



Thursday 23 October 2008
 from 15:00 to 17:50
 US/Central
 at LPC (ROC (WH11NW))
 chaired by: *Yurii Maravin (KSU)*

Description: Talks on ongoing diboson analyses

[Thursday 23 October 2008 |](#)

Thursday 23 October 2008 [top↑](#)

15:00 Welcome and introduction (05)	Yurii Maravin (KSU)
15:05 Diboson analyses (20) Slides	Vuko Brigljevic (Institute Ruder Boskovic, Zagreb)
15:25 Diboson physics: Experience at Tevatron (25) Slides	Tom Diehl (FNAL)
15:50 WZ (30) Slides	Ketino Kaadze (Fermilab)
16:20 Zg (30) Slides	Yuri Gershtein (Rutgers University)
16:50 WW (30) Slides	Dmytro Kovalskyi (UCSB)
17:20 ZZ (30) Slides	Alexey Drozdetskiy (University of Florida, Gainesville)

Participants

- ▶ Overall subscription to the dilepton hypernews exceeds hundred people
 - In reality the list of active participants is much smaller
- ▶ A list of dilepton WG participants (**names of senior people are in red**, and students and postdocs are in black)
 - LPC residents
 - **Jeff Berryhill**, Irakli Chakaberia, **Dan Green**, **Eric James**, Misha Makouski, **YM**, **Leonard Spiegel**, Irakli Svintradze, Ping Tan, Renata Rodriguez, Jeremy Werner
 - Remote participants (whoever gave talks in the past year)
 - Nadia Adam, **Tulika Bose**, Edgar Carrera, **Dmitri Bourilkov**, **Vuko Brigljevic**, Adam Everrt, **Ivan Furic**, Zoltan Gecse, **Valerie Halyo**, Zhen Hu, Jeff Klukas, **YM**, Alex Petrescu, Matteo Sani, **Alexei Safonov**, Yu Zhen...

Tag and probe

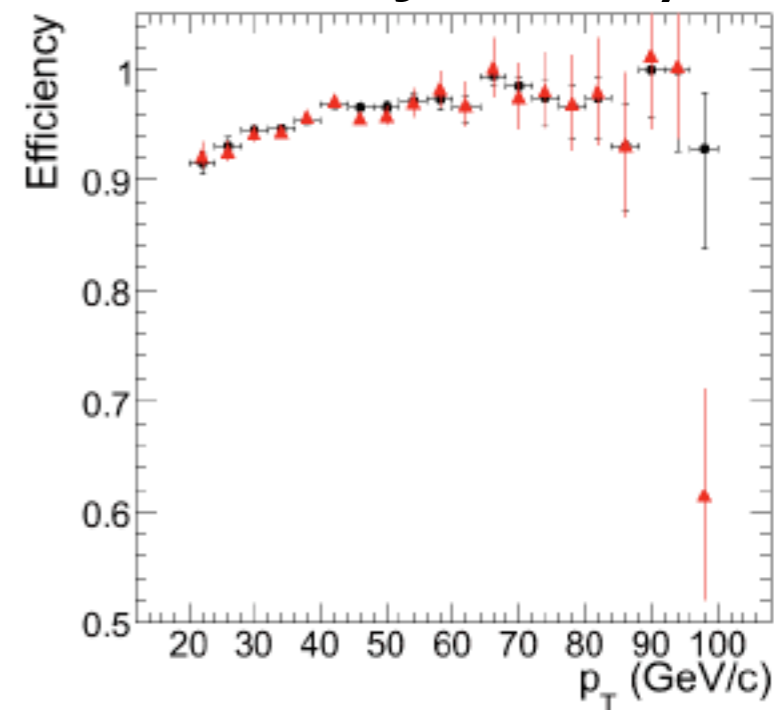
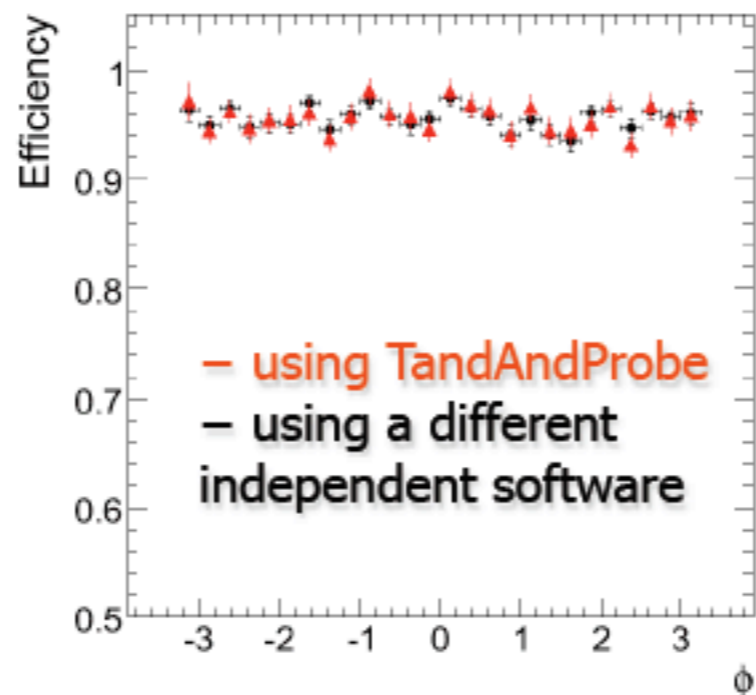
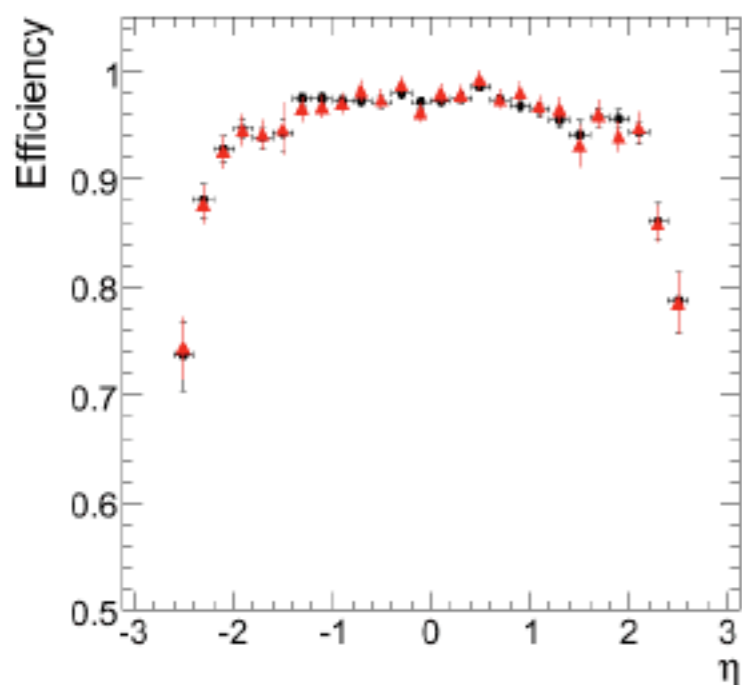
Nadia Adam, Jeff Berryhill, Valerie Halyo, Adam Hunt, Kalanand Mishra

► Dilepton group produced at least two tools that have originated at LPC and became official CMS products

- Tag and probe tool to extract efficiency

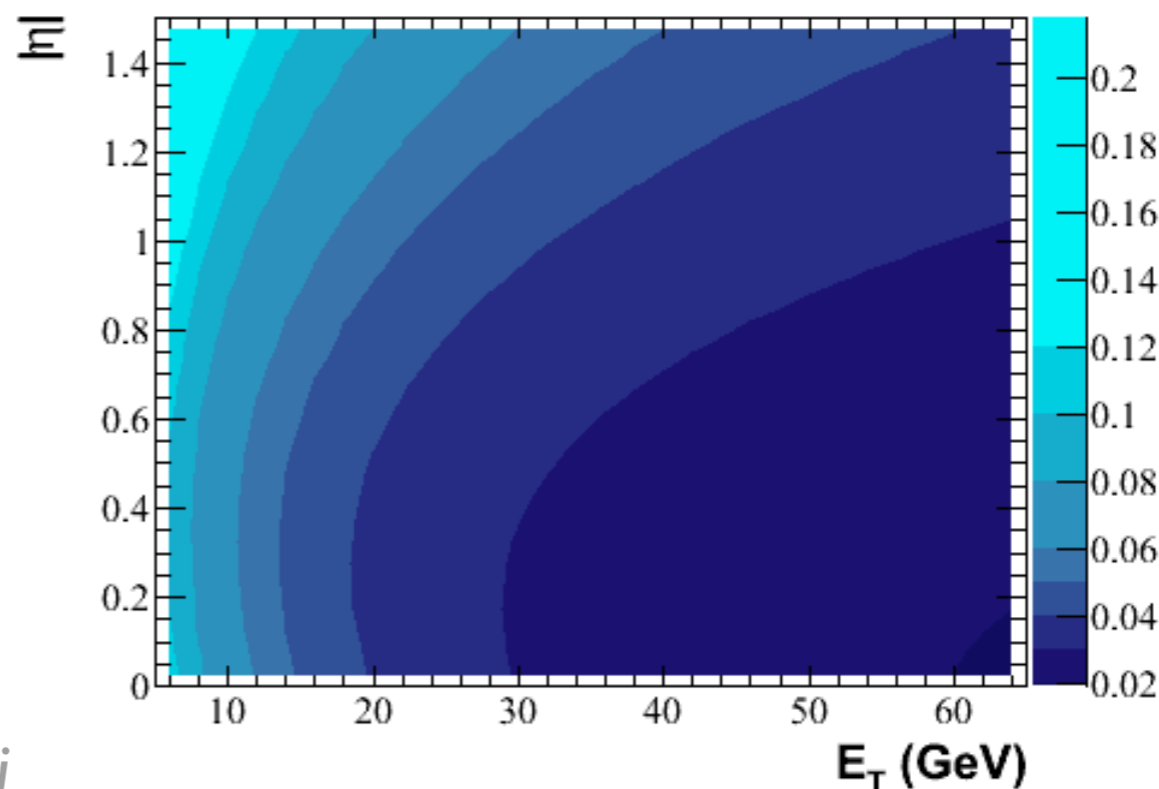
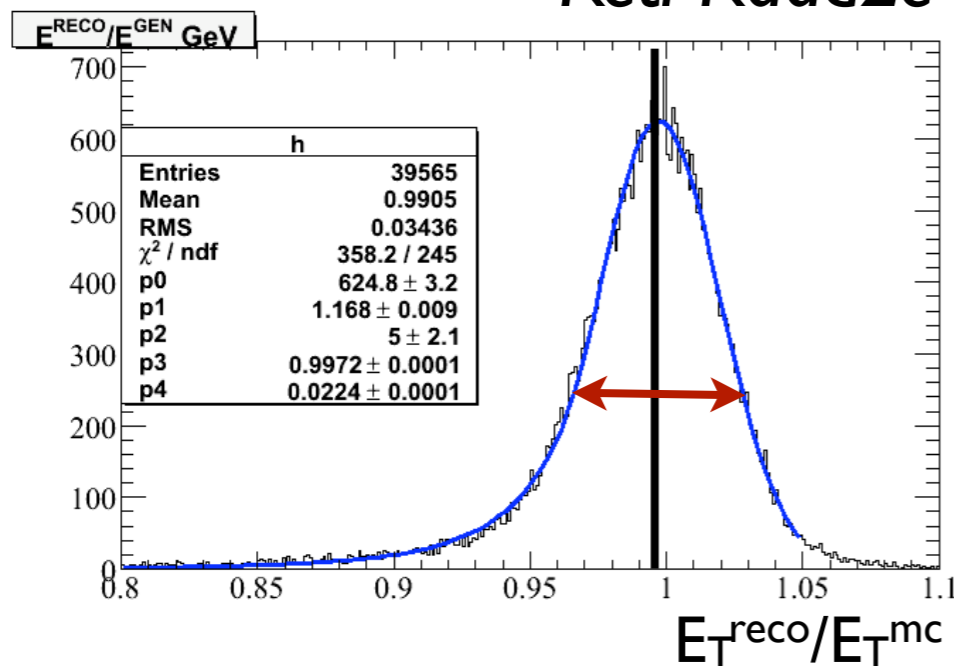
- Synergy with LPC $e\gamma$ and CMS EWK group (Jeff Berryhill)
- Tag and probe method was validated in CSA08 $Z \rightarrow ee$ simulation
- An official part of the CMSSW 31X release

Kalanand Mishra & Jeff Berryhill



- ▶ Bremsstrahlung energy loss is the dominant factor that affects ECAL energy resolution and energy scale
- ▶ Redesign energy correction scheme, obtain energy measurement uncertainties, implement for CMSSW 31X
 - Work is needed for data-driven methods and overall improvements in clustering algorithms (workshop tomorrow!)

Keti Kaadze

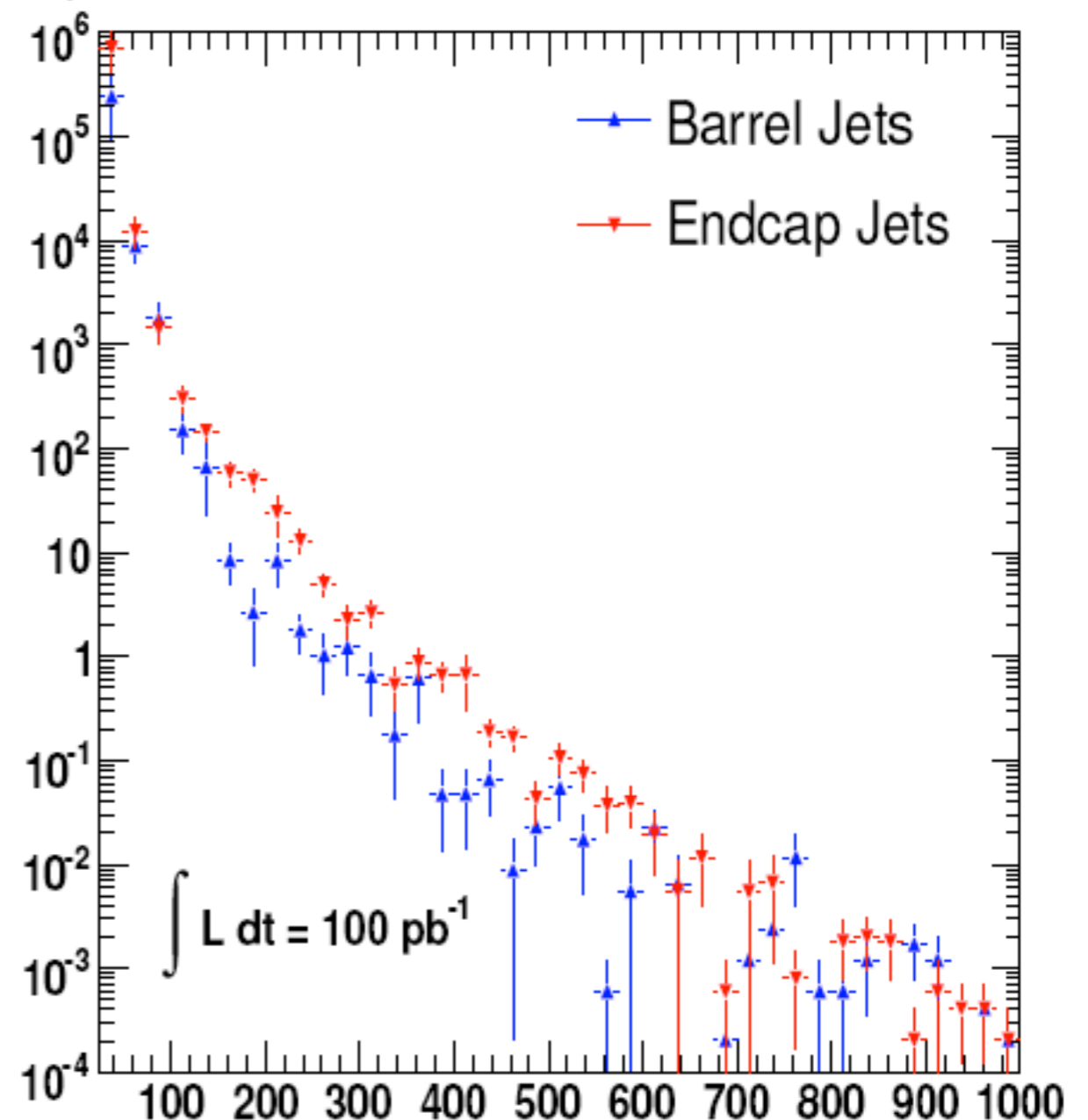


Dmitry Bandurin, Jeremy Werner

▶ A beautiful tool that allows to preselect jets at generator level that will most likely to be identified as photons and electrons

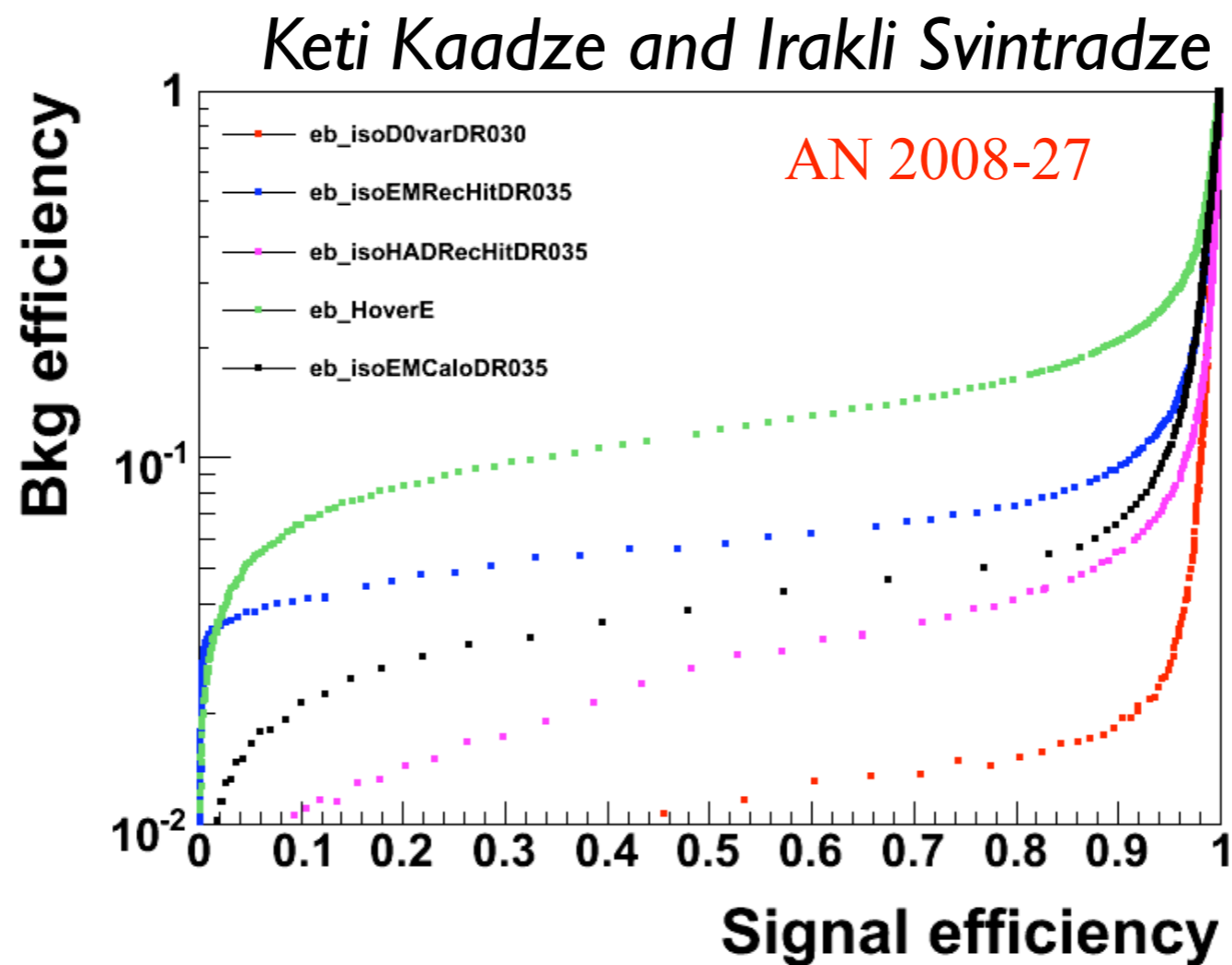
- Well documented:
 CMS AN-2008/023,
 CMS AN-2008/028,
 CMS AN-2008/044

Jet E_T Spectrum for Di-Jet Events which Pass e^\pm Selection



Electron ID

- ▶ Simpler electron identification criteria that should work well with early data
 - Combining isolation and electron ID for $Z \rightarrow ee$ identification



► For the full list of names see Valerie's talk on LPC group heads meeting on 04/03

- $J/\Psi \rightarrow \mu\mu$: FNAL, UF, PKU, Purdue
- $Y \rightarrow \mu\mu$: Purdue, UF, PKU, Princeton
- $Y \rightarrow ee$: Princeton, KSU
- **Drell-Yan**: UF
- $Z \rightarrow ee$: FNAL, Princeton, Minnesota, ...
- $Z \rightarrow \mu\mu$: Brown, Princeton, Purdue, ...
- **W charge and Z FB asymmetry**: FNAL, Rochester, ...
- **WZ**: KSU
- **WZ new phenomena**: Boston, KSU, Princeton, UWM
- Z' and W'



Theory EWK papers (Valerie *et al*)

Theoretical uncertainties in $Z \rightarrow \ell\ell$

Theoretical uncertainties in $W \rightarrow \ell\nu$

- ▶ LPC dilepton group is small but active
 - Quite a lot of work is yet to be done, please join!
 - Contact Valerie Halyo or me if you have any questions

- ▶ We have produced several approved results and now prepare for data!

14:30	Di-Lepton Overview (10')	Yurii Maravin (KSU)
14:40	Measurement of the $Z \rightarrow e + e$ Cross Section at 10 TeV (10')	Jeremy Werner (Princeton)
14:50	Measurement of the W Muonic Charge Asymmetry (10') ( Slides )	Ping Tan (Fermilab)
15:00	Measurement of the Z/DY F/B Decay Asymmetry (10')	Renata Rodrigues (CBPF/FNAL)
15:10	Measurement of Upsilon Production (10')	Yu Zheng (Purdue)
15:20	Physics with WZ Production at CMS (10')	Irakli Chakaberia (KSU)