PARTICLE PHYSICS JOINT LAB JAPAN - FRANCE

ILC_01

Fujii (KEK), Tanabe, Suehara (Tokyo), Ishikawa, Sumino (Tohoku), Kiyo (Juntendo) Le Diberder, Poeschl, Richard, Kou (LAL-Orsay)

FKPPL-TYL joint workshop @ Yonsei University 4-5th June 2013

ILC International Linear Collider

• The LHC discovery of Higgs particle completed all the particles needed in SM.

Now we are aiming at precisely measuring the properties of these particles, to search for signs of new physics.

Challenges towards precision can adequately be met in a clean environment e+e- colliders.



Top physics at ILC



Top properties have significant impact in the search of physics beyond SM is e.g. in SM, Higgs, W and top masses are strongly correlated.







Top quark has a mass near the electro-weak scale by ytop -1, most intriguing and important to measure!

Member's activities on ILC Top

 Properties of top: mass, width and cross section Ishikawa (Tohoku), Fujii (KEK), also similar study done in Munich Coupling of top: Top Yukawa coupling Tanaba (Tokyo) in collaboration with KEK and Birmingham • BSM: anomalous couplings to BSM gauge bosons (Z', W', Extra dimension etc) Poescl, Richard (LAL-Orsay) in collaboration with Valencia Theory (SM prediction, BSM possibility) Kiyo (Juntendo), Sumino (Tohoku)

The tt threshold scan -350 GeV



from cross section!

Results presented at ECFA 2013, M. Stahlhofenm F. Simon, T. Horiguchi



- $-\sqrt{s}=500 \text{ GeV}$, L=1 ab⁻¹, $\Delta y_t/y_t \sim 11\%$ [preliminary]
- $-\sqrt{s}=1$ TeV, L=1 ab⁻¹, $\Delta y_t/y_t \sim 4\%$

result presented at ECFA 2013, T. Tanabe

state effect!



result presented at ECFA 2013 by Garcia

TYL ILC Top collaboration

Identified common issues which are relevant for all analyses:

- Experimental topics (Tokyo-Tohoku-KEK-LAL) :
 - ✓ b-tagging and charge identification
 - ✓ jet algorithm (Durham-algorithm, kt-algorithm etc...)
 - ✓ luminosity measurement
 - ✓ refinement of the current analysis

Theoretical topics (Juntendo-Tohoku-LAL):

- ✓ theoretical uncertainties (QCD, electroweak corrections)
- ✓ new observables, new ideas!

Planning

- Ist phase : Initiating collaboration
 - ✓ Possible collaborations already discussed
 - a) Preliminary discussion at ECFA 2013 (DESY)
- 2nd phase : Developing collaborative work
 - ✓ Organization of Top-ILC workshop
 - a) Satellite workshop to the LCWS 2013 at Tokyo
 - b) Satellite workshop to the TYL 2014 in France
 - ✓ Role as a seed for ILC Top working group
 - ✓ Publication, LC note, ...
- 3rd phase : Further developing the France-Japan collaboration
 - ✓ joint-PhD, joint-postdoc etc....