

Physics Analyses and Optimisation Studies in ILD

Message from Oshu: Still work to do

- Physics Case
- Understanding Systematics, Calibration & Co
- Justifying the TPC
- Justifying size & cost

=> Try to get an overview (once again...)

If your analysis is not on the pages below, please send

- Analysis subject, ECM
- Main analyser (and collaborators)
- Email of main analyser
- FullSim / FastSim
- Status: just starting / ongoing / mature /..
- Any comments, corrections, ...

Physics Analyses

Analysis Contact	institute	Topic	ECM	Full / Fast	Status	Comment
Mark Thomson et al	Cambridge	Higgs hadronic recoil & invis	350	FullSim	done	publication in prep
Mikael Berggren	DESY	Sleptons, reco and disc. reach	500/ ...	SGV	ongoing	incl. selectrons from S.Caiazza
Moritz Habermehl	DESY	modelindep WIMPs	350/500	FullSim & extrap	starting	Taking over from A.Chaus, focus on systematics
Claude Duerig	DESY	ee->ZHH, 2x H->bb	500	FullSim	ongoing	Kinfit, ME, Jet Finding
Madalina Chera	DESY	SUSY Point 5 chi->Z/W->qq	500	FullSim & SGV	ongoing	Comparison Lol, DBD, SGV
Hale Sert	DESY	Light Higgsinos, dM <= 1 GeV	500	SGV & FullSim	ongoing	has to hand-in thesis in early 2015
Yorgos Voutsinas	DESY	Light Higgsinos, dM <= 1 GeV	500	FullSim	starting	Taking over from Hale, focussing on VXD requirements
Felix Mueller	DESY	ee-> nunu H, BRs & ZH/WW	350	FullSim	ongoing	
Shin-ichi Kawada	Hiroshima	H->tautau	250/500	Full Sim	almost	updating with mH=125 GeV
Marcel Vos	IFIC	top couplings	500	FullSim	ongoing	Jet finding
Brian van Doren	Kansas U	?				
Graham Wilson	Kansus U	W mass measurement	161/350 /500	?		
Tino Calancha	KEK	H->mumu, H->gam gam	250/500 /1000	Full Sim	ongoing	now mainly on H->gam gam at 250 GeV, and H->mumu at 250 and 500 GeV
Junping Tian	KEK	ee->vvHH, 2x H->bb	1000	Full Sim	almost	need be updated to mH=125GeV, being considered as one early publication
Junping Tian	KEK	vvH with H->bb, WW*, ZZ*	500	Full Sim	almost	For total width study, only full hadronic decay of ZZ* remains to be done
Junping Tian	KEK	ZZ-fusion production eeH	500	Full Sim	ongoing	H->bb done, going to explore anomalous HZZ coupling, particularly CP violation effect
Tomohisa Ogawa	KEK	tbd				PhD project
Yuji Sudo	Kyushu	ttH	500	FullSim	ongoing	looking at systematics, cut opt / MVA
Tatsuhiko Tomita	Kyushu	Higgs hadronic recoil	250	FullSim	ongoing	ISR tagging, cut opt for model independency
Roman Poeschl et al	LAL	top couplings	500	FullSim	ongoing	Jet Charge
PhD MPI	MPI	tbd				
Postdoc MPI	MPI	tbd				
Hiroaki Ono	NDU	Higgs BR, Z->ll,qq	250/350	FullSim	ongoing	H->bb,cc,gg & H->WW*, updating with mH=125GeV
Koya Tsuchimoto	Shinshu	single W process, W mass and TGC	250/500	Full Sim	starting	motivated by impact of ScECAL on JER, going to be a master project
Abhinav Dubey	Tohoku	Heavy Higgs search (Neutral)	500/100	0 Full Sim	ongoing	e+e- ? HA ? 4b
Shun Watanuki	Tohoku	Higgs recoil mass	250	FullSim	ongoing	Fitting techniques, systematic error of mass, CP
Akimasa Ishikawa	Tohoku	H->Invisible	250	Full Sim	ongoing	almost done
Yuko Shinzaki	Tohoku	Charged Higgs search	250	Full Sim	ongoing	e+e- ? WH ? W(WZ)
Masakazu Kurata	Tokyo	ZHH, HH->WWbb	500	FullSim	ongoing	PID, jet pairing
Tomohiko Tanabe	Tokyo	electroweakino scan	500	SGV	ongoing	need scan points
Takuaki Mori	Tokyo	Radiative Natural SUSY benchmark	500	Fast/FullSim	starting	input for gaugino mass unification plot
Jacqueline Yan	Tokyo	Higgs leptonic recoil	350	FullSim	ongoing	comparison with 250 GeV, next focus on mass

Detector Optimisation

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Yorgos Voutsinas	DESY	VXD time/point res optimisation	500	FullSim	starting	Physics benchmark: light Higgsinos
Benjamin Boitrelle	DESY	VXD time/point res optimisation	350	FullSim	starting	Physics benchmark: H->c \bar{c}
Tino Calancha	KEK	photon energy resolution, momentum resolution	500/100	0 Full Sim	ongoing	Physics benchmark: H-> $\gamma\gamma$, H-> $\mu\mu$
Tomohisa Ogawa	KEK	SiW vs SciW ECAL, TPC radius	250/350	Full Sim / SGV	ongoing	Physics benchmark: H->invisible, leptonic recoil with various TPC radius (SGV);

Reconstruction & Analysis Tools

Analysis

Contact	institute	Topic	ECM	Full / Fast	Status	Comment
Moritz Habermehl	DESY	Whizard 2 comissioning			ongoing	new GuineaPig interface, physics appl: WIMPs
Mikael Berggren	DESY	Colour Singlet Truth Jet Finder			done	will be in next release, physics appl: ZHH
Mikael Berggren	DESY	SGV Maintenance		SGV	stable	several improvements in pipeline
Eldwan Brianne	DESY	Particle Flow in SGV		FullSim & SGV	ongoing	paused due to Calice testbeam
Yorgos Voutsinas	DESY	mini-vector tracking in VDX/ SIT		FullSim	nearly done	
Hale Sert Masakazu	DESY	mu/pi separation for E<2 GeV	500	FullSim	done	has to hand-in thesis in early 2015
Kurata Roman	Tokyo	dE/dx and Calo PiD	500	FullSim	ongoing	physics benchmark:ZHH
Poeschl et al	LAL	Jet Charge	500	FullSim	ongoing	physics benchmark: A_FB in ttbar
Marcel Vos		Jet Finding	500	FullSim	ongoing	physics benchmark: A_FB in ttbar
Masakazu Kurata	Tokyo	vertex charge, pi0 attach	500	FullSim	ongoing	physics benchmark:ZHH, tt
Junping Tian	KEK	matrix element package (physsim)		Full Sim	ongoing	implement major LCME class in SM, support anomalous coupling
Junping Tian	KEK	realistic color singlet jet clustering		Full Sim	ongoing	Mini-jet based, incorporating new Geogi Algorithm
Taikan Suehara	Kyushu	tau finder	250/500	Full Sim	almost	optimization
Tino Calancha	KEK	Covariance matrix of four momentum, event by event mass resolution		Full Sim	ongoing	done for charged track in H-->mumu, can start for H-->gam gam
Brian van Doren	Kansas U	pi0 reconstruction		FullSim	ongoing	application: eg Higgs mass reco