DBD (Re)Production and New UO Production

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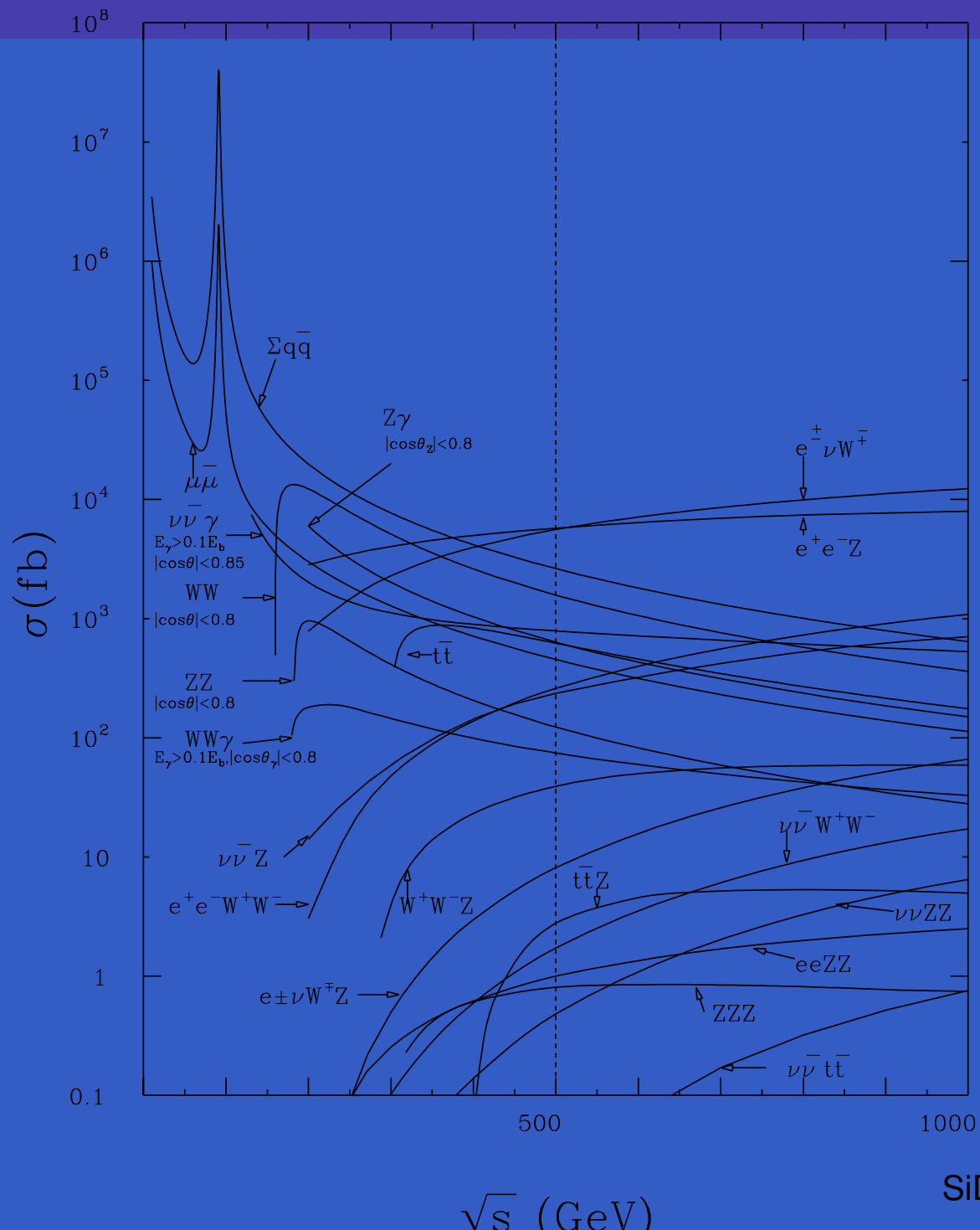
DBD Sample (Re)Production on UO Cluster

- ILC parameters $\sqrt{s}$= 250GeV, L= 250fb^{-1} (not included: $\sqrt{s} = 350, 500, 1000$ GeV).

- Whizard 1.40 used for event generation including ISR, beamstrahlung, polarization (80/30).

- Whizard StdHep files (500 event/file) pulled from the SLAC Confluence to UO hepilc cluster.

- SiD simulation and digitization now running with ILCSoft v02-00-02 and SiD_o2_v03.

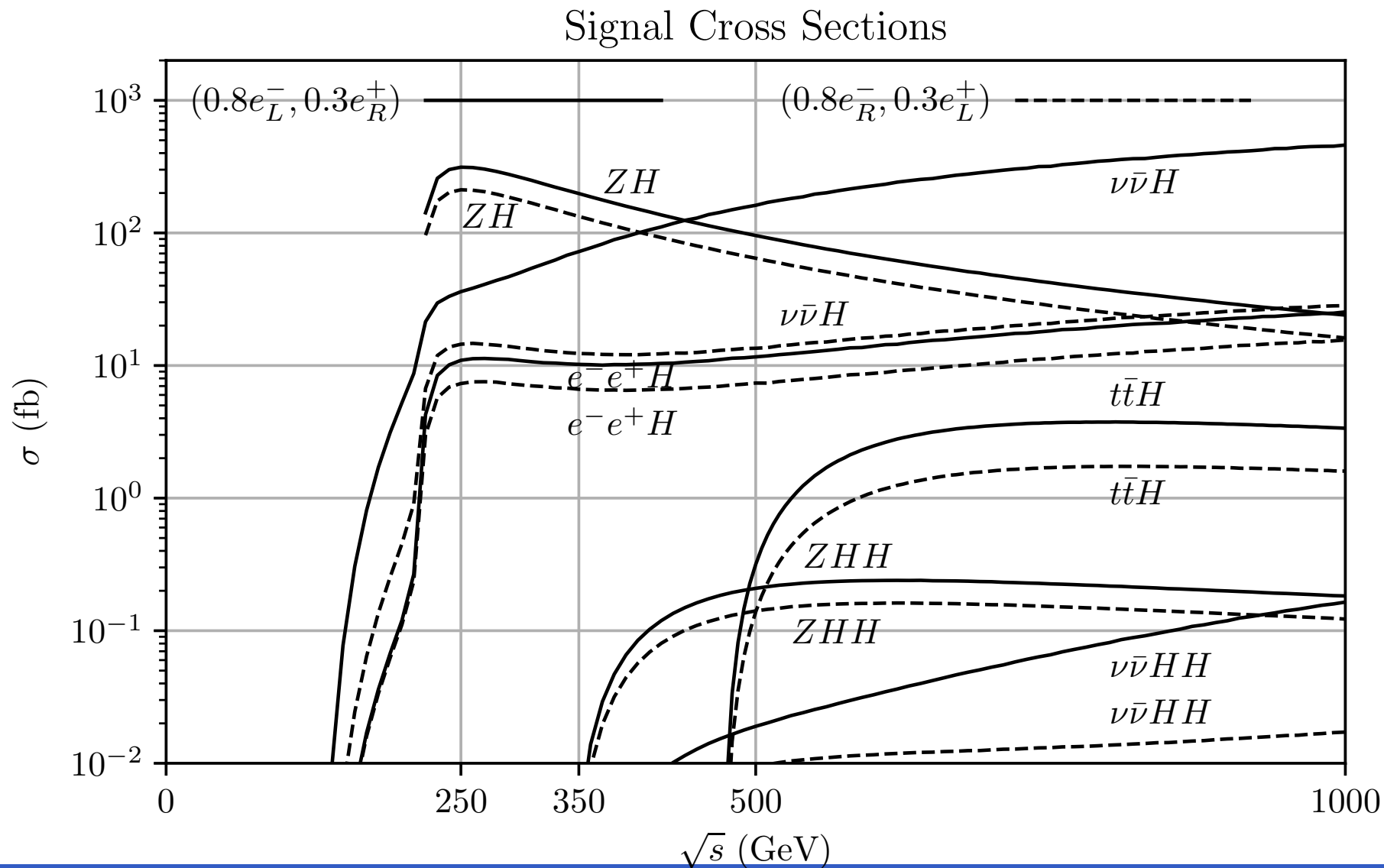| Sample	Polarization	N_{files}	Finished?
all_SM_background	$+-/-+$	5646/4117	yes
evW_eeZ_vvZ_semileptonic	$+-/-+$	4061/2972	yes
lepton_SM_background	$+-/-+$	10801/5792	no
ZZ_leptonic	$+-/-+$	285/285	yes
aa_lowpt	$+-/-+$	4399/4399	no
higgs_ffh	$+-/-+$	543/543	yes
higgs_ffh_invisible	$+-/-+$	240/241	yes
higgs_ffh_mumu	$+-/-+$	240/241	yes
higgs_ffh_zgamma	$+-/-+$	240/241	yes
higgs_ffh_zz	$+-/-+$	240/241	yes
e2e2h_mh125p00	$+-/-+$	704/704	yes

2019/2020 New Production on UO Cluster

- Production targets the staged ILC250: $\sqrt{s}$= 250GeV, L= 0.1ab^{-1}.

- Whizard 2.6.3 used for event generation including ISR, beamstrahlung, polarization (80/30).

- Beamstrahlung obtained with Guineapig 1.4.4 using staged ILC250 beam parameters.

- SiD simulation **and Digitization** with ILCSoft v02-00-02 and SiD_o2_v03.

Process	Polarization	Cross Section (pb)	Nev(10K)
$\mu^+\mu^-$	$+-/-+$	5.15/6.43	52/64
$\tau^+\tau^-$	$+-/-+$	5.02/6.36	50/64
$u\bar{u}/d\bar{d}/s\bar{s}$	$+-/-+$	29.9/49.5	300/495
$c\bar{c}$	$+-/-+$	10.7/16.5	107/165
$b\bar{b}$	$+-/-+$	9.44/16.3	94/163
WW	$+-/-+$	2.607/37.9	26/380
$We\nu$	$+-/-+$	1.02/10.4	10/104
ZZ	$+-/-+$	0.837/1.830	8/18
Zee	$+-/-+$	2.43/3.00	24/30
$Z\nu\bar{\nu}$	$+-/-+$	0.119/0.353	1/4
ZH	$+-/-+$	0.200/0.297	20/30

Whizard 2.6.4 Higgs Cross Section Plot

Signal Cross Sections

$(0.8e_L^-, 0.3e_R^+)$ ——— $(0.8e_R^-, 0.3e_L^+)$ - - - - -

ZH, $\nu\bar{\nu}H$, e^-e^+H, $t\bar{t}H$, ZHH, $\nu\bar{\nu}HH$

σ (fb) vs $\sqrt{s}$ (GeV)

Remarks

- The Whizard 1.4.0 files used for the DBD study at $\sqrt{s} =$250 GeV are being reprocessed with ILCSoft v02-00-02 and SiD_o2_v03 on the hepilc cluster.

- A new production at $\sqrt{s} =$250 GeV with Whizard 2.6.3 has finished with ILCSoft v02-00-02 and SiD_o2_v03 on the hepilc cluster.

- In the new production, the individual processes are isolated to separate files whereas in the DBD production the files are inclusive.

- For both productions, the digitized samples are stored in LCIO files and can be accessed either with Marlin or pyLCIO.

- For UO hepilc cluster (from KEK via PNNL) details, see the Optimization talk of 12 Dec. 2018.

- A new Higgs cross section plot is available, feel free to use it.