

# Status of Cross Section Database

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# The japanese ILC XSEC DB is already here!



## Motivation

- Create database with cross sections for all ILC samples (DBD and post DBD).
  - **Just official samples.** No intention to include user generated ones.
- Provide both: cross section at full polarized beam and at ILC designed scenario.
- Avoid every user need to collect such information by themselves.
- **Safe**, robust, **easy** to use, fast.
- Useful tool during coffee break discussions.



# Wish List

- It is painful to collect all those ILC SM cross sections. I am worried to make a mistake!
- you don't need to do it, I already did for you!
- I found one mistake in the polarisation weight on one of my samples.
- Don't need to deal with this anymore: I provide you also xsec at target beam pol.
- I would like to explore my decay channels at different beam pol scenarios but I don't want to recalculate the cross sections.
- You can provide whatever beam pol parameters you want: cross sections at such beam pol. are calculated on the fly for you.
- Sometimes in coffee discussion LHC buddies ask me how much events we expect in one particular channel/scenario (and I never remember).
- No problem, I also give you the number of events at the assumed L int. and beam pol.
- In addition: a simple interface and the comments recorded in the metadata could also be retrieved.
- Wow!, that DB sounds really cool, but ... I am sure it's hard to use. (Still learning C++, don't want to learn more languages!)
- No problem, actually it is very easy. You already know all you need

## Design

- Original design just ascii tables.
- Moved into a proper database:
  - Fields: ID (I200050), process name (4f\_szeorsw\_l), pol tag (eL.pR), crossx.
  - Full polarised beam crossx ( $P_{e-}=-1$ ,  $P_{e+}=1$ ) and at ILC target (e.g.  $P_{e-}=-0.8$ ,  $P_{e+}=0.2$  at  $e_{cm}=1000$ ) are shown.
  - User can provide different polarisation parameters.
- Command line version **need changes** to managed the new DB structure.
  - Lots of progress also here. It will be available soon.
- Web browser version running on server accesible without VPN.
- Tested implementation: it is nicely working and very fast.

$$N_{events} = X \cdot L \quad (1)$$

$N_{events}$ : expected number of events  
X: returned value  
L: integrated luminosity

## Cross sections collected from metadata files

- Initial plan was to keep record **just** of cross sections from the generator log files.
  - Previous versions following such convention have been **DEPRECATED**.
- New version satisfy Eq.1 **ALWAYS**.
- This is because the new version use the xsec from the METADATA files:
  - These are the final sec. so they satisfy Eq.1.
  - Samples with restricted decays (i.e. nnh\_mumu) already include the branching ratio.
  - Bremsstrahlung processes also include  $\gamma - \gamma$  luminosity factor.
  - Any correction factor included (e.g. factor 2 from physim bug during 350 production is there).

Web Interfaz location is in the backup. Send me any bugs or questions about this tool (thank you)

## Summary

- Developed database with cross sections of official ILC samples.
- Cross sections collected from metadata files.
- Those are the real cross sections:
  - All information taken in account: branching ratios,  $\gamma - \gamma$  luminosities, factor for applied corrections.
  - Returned value always satisfies:  $N_{events} = X \cdot L$

## Plan

- The command line tool can not manage the new version (yet).
- Plan to also finish this tool which will run on kekcc without super user privileges.
- I will make it available soon.

# BACK UP



# Record this link in your web browser favourites

The screenshot shows a Mozilla Firefox browser window displaying the ILC Cross Section Database website. The browser's address bar shows the URL `www.jlc.kek.jp/jlc/en/ilc-xsec-database`. The website header features the ILC logo and the text "Physics and Detector at International Linear Collider (ILC) Uncover the Secrets of the Creation and Evolution of the Universe".

The main content area is titled "ILC Cross Section Database" and includes a search bar, a "Home" link, and a form for entering search criteria. The form fields are:

- ECM:  (Mandatory: 250, 350, 500 or 1000)
- ID:  (e.g. 1200650 OR 2000650)
- Process:  (e.g. `4f_xsecrsw_1`)
- Process type:  (e.g. `4f_single2singleMLx_leptonlc`)
- Polarisation tag:  (e.g. `el_pR`)
- e- pol:  (e.g. `-0.8`)
- ee pol:  (e.g. `+0.2`)
- L fb-1:  (e.g. 258)
- Show comments:  (e.g. 1 enable / 0 disable)

A "Enter" button is located below the form. Below the form is a table with the following data:

ECM	ID	NAME	PTYPE	REL-TAG	XSEC (full pol.)	XSEC at (-0.8, +0.3)	R at 250 fb-1 (-0.8, +0.3)
250	106483	rwh	rwh	eL_pR	120.62097	75.25430245	18813.6

At the bottom of the main content area, it says "Powered by Drupal".

The right sidebar contains a search bar, a "Physics Menu" with links to "Top Quark Physics", "ILC Related Links", "ILC General" (with links to "ILC Home" and "ILC Highlights"), "ILC Physics" (with links to "Introduction to HEP (japanese)" and "ILC Physics Subgroup"), "ILC Detectors" (with links to "ILC Physics & Detectors" and "ILD Detector"), "ILC Accelerator" (with links to "Asian Regional Team" and "LC Promotion Office (japanese)"), and "Upcoming Events" (with a link to "The 37th general meeting of the ILC physics working group").