Working together with Denis since 2006

Iwate Prefectural University

Atsuto Suzuki

France Japan Particle Physics Laboratory (FJPPL) with Denis

Signed on May 29th , 2006

CONVENTION DE CREATION D'UN LABORATOIRE INTERNATIONAL ASSOCIÉ (LIA)

"France Japan Particle Physics Laboratory" (FJ-PPL)

POUR LES PARTIES FRANÇAISES

Le ***Centre national de la recherche scientifique,*** ci-après dénommé **CNRS**, établissement public à caractère scientifique et technologique dont le siège est sis 3, rue Michel-Ange, 75794 Paris Cedex 16 (France), représenté par son Directeur Général, Arnold MIGUS,

Agissant au nom et pour le compte de :

l'**Institut National de Physique Nucléaire et de Physique des Particules**, ci-après dénommé **IN2P3**, représenté par son directeur, Michel SPIRO,

Pour le Centre National de la Recherche Scientifique

Arnold MIGUS
Directeur général du CNRS

CNRS

Pour l'Institut national de physique nucléaire et de physique des particules

Michel SPIRO
Directeur de l'IN2P3

IN2P3

Pour le Commissariat à l'énergie atomique

Yves CARISTAN
Directeur des Sciences de la matière

CEA

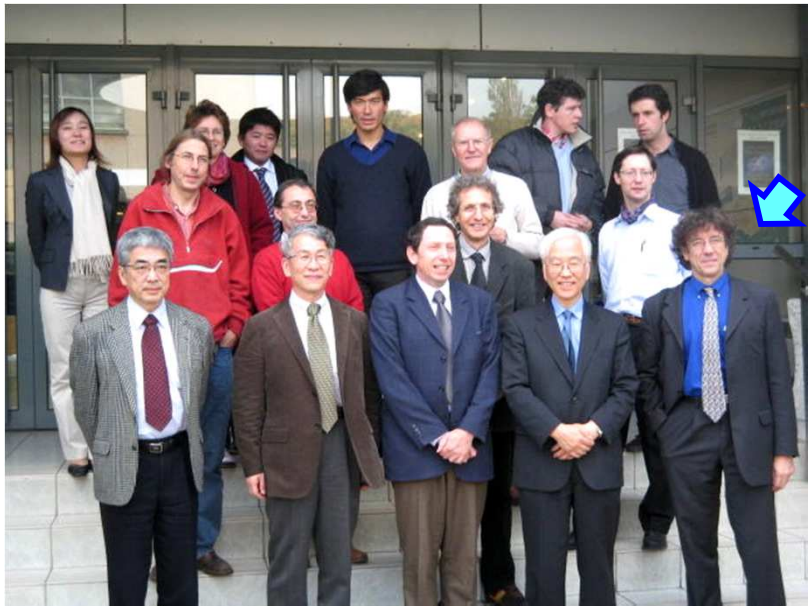
Pour la High Energy Accelerator Research Organization

Atsuto SUZUKI
Directeur général de la KEK

KEK

FJPPL Office in KEK

Tight Collaboration between KEK and France Laboratories in November, 2006



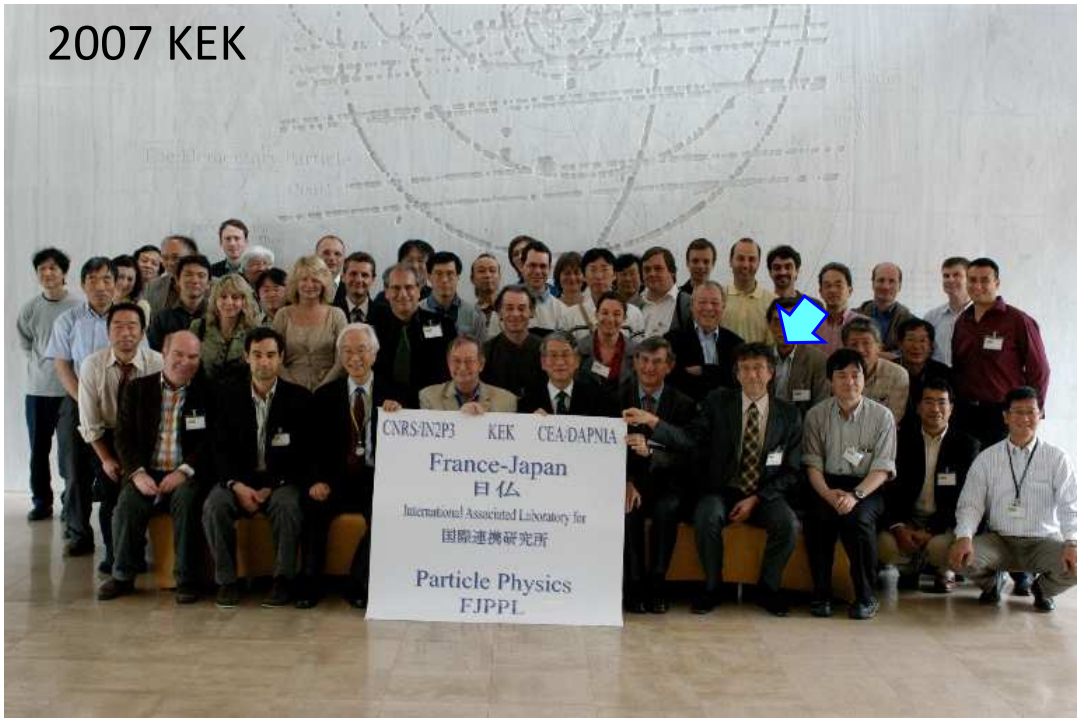
CNRS/IN2P3

CNRS/Orsay

CEA/Saclay

FJPPL Workshop

2007 KEK



2008 CNRS

Workshop FJPPL'07

9 mai 2007 à 09:00 → 12 mai 2007 à 18:30 Europe/Paris

Bldg 4 1st floor Seminar Hall (KEK, Tsukuba Japan)

Denis Perret-Gallix (IN2P3/CNRS) , Fumihiko Takasaki (KEK)

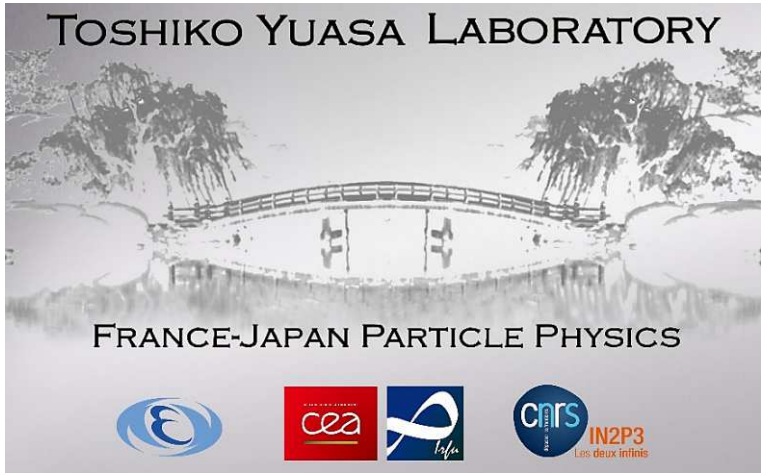
organizer

FJPPL = Toshiko Yuasa Lab. (TYL) Launched in 2009

日仏素粒子物理学研究所
Toshiko Yuasa Laboratory

From left to right: Fumihiko Takasaki (Japanese TYL Director, KEK), Etienne Augé (IN2P3/CNRS dep. Director), Atsuto Suzuki (KEK Director General), Nicolas Alamanos (CEA/Irfu Dep. Director), Sawako Hanyu （Ochanomizu Univ. President), Yuzo ASANO （Yuasa's Family), Toshio ICHII （Yuasa's Family), Denis Perret-Gallix (French TYL Director, CNRS/IN2P3)

at Ochanomizu Univ. (her alma mater)

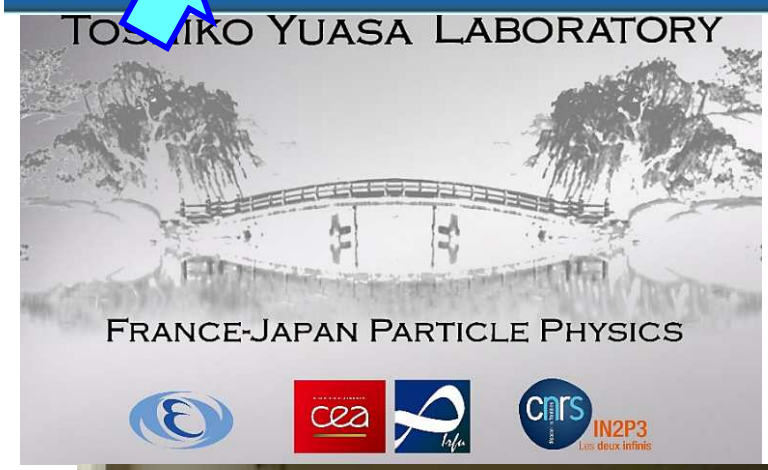


Workshop TYL'10

15 juin 2010 à 08:30 → 17 juin 2010 à 23:30 Europe/Paris

Petit Amphi (LAPP, Annecy-Le-Vieux (France))

Denis Perret-Gallix (IN2P3/CNRS) , Fumihiko Takasaki (KEK)



Accelerators and Particle Physics in Japan

ATSUTO SUZUKI

Workshop FJPPL'10, LAPP, Annecy-Le-Vieux
15-17 June 2010

EU-Japan Cooperation
“High Energy Accelerator Science”

First EU-Japan Joint Science & Technology Committee Meeting,16 June 2011

France

Germany

Beer Party in 2009

Green ILC with Denis

Proposed ICFA Panel on Sustainable Accelerators and Colliders **2012？**

The recommendation for this ICFA Panel had been earlier submitted by Atsuto Suzuki (Attachment VII); Mitsuaki Nozaki discussed this further (Attachment VIII). The goal is to improve the power efficiency of every accelerator component; to have energy recovery from the accelerator; to re-use the recovered energy; and to have a stand-alone system to provide all or part of the accelerator power needs.

Dear Atsuto, David and Lenny,

At Friday's ICFA meeting, there was a discussion on Atsuto's proposal for an ICFA Panel on sustainable accelerator/colliders. ICFA requested that the three of you, representing your respective regions, look at the initiatives which already exist in this area, and provide a possible Panel mandate and achievable goal if you believe that there is something that ICFA can usefully add.

Best regards, Steinar

2nd Workshop
Energy for Sustainable Science
at Research Infrastructures

23-25 October 2013
CERN
Europe/Zurich timezone

ILC: an amazing energy transformer

FROM eV TO TeV:

THE GREEN ILC

Denis Perret-Gallix
LAPP/IN2P3.CNRS (France)

Energy Management in Japan, Consequences for Research Infrastructures

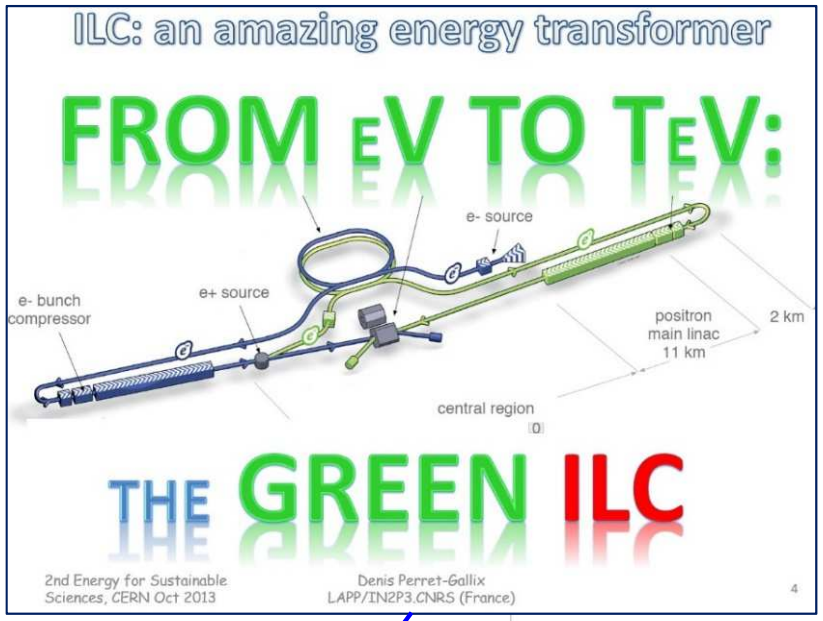
Masakazu Yoshioka (KEK)

1. Electric power supply in Japan, before and after March 11, 2011 earthquake
   - High efficiency and "almost" environmental pollution-free electricity generators can save Japan, and contribute to reduce global CO_2 problem
2. KEK Electricity contract as an example of large-scale RIs
3. Accelerator design by considering optimization of luminosity/electricity demand
   - Example: Super-KEKB
   - ILC
4. Accelerator component design by considering high power-efficiency
   - Klystron
   - Availability based on MTBF and MTTR
5. Summary

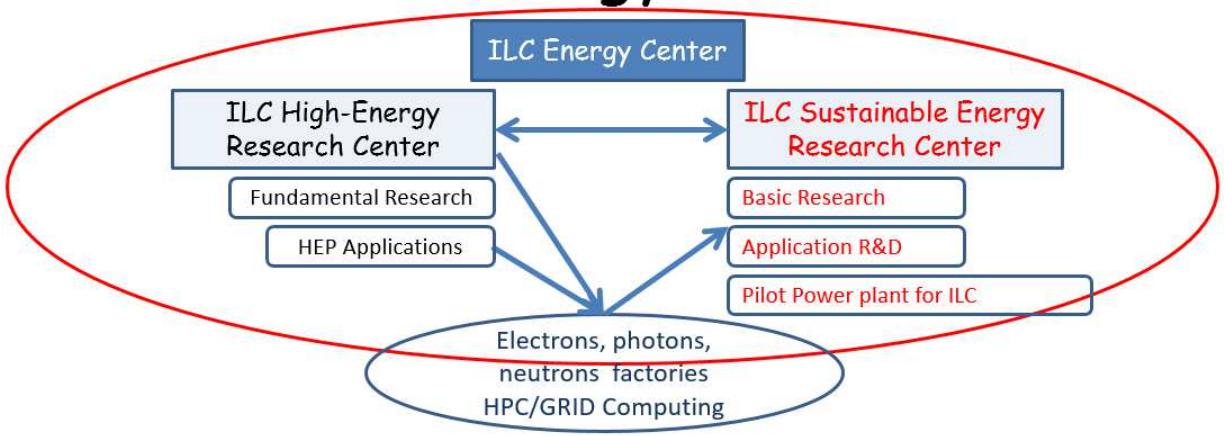
Energy Management at KEK, Strategy on Energy Management, Efficiency, Sustainability

Atsuto Suzuki (KEK)

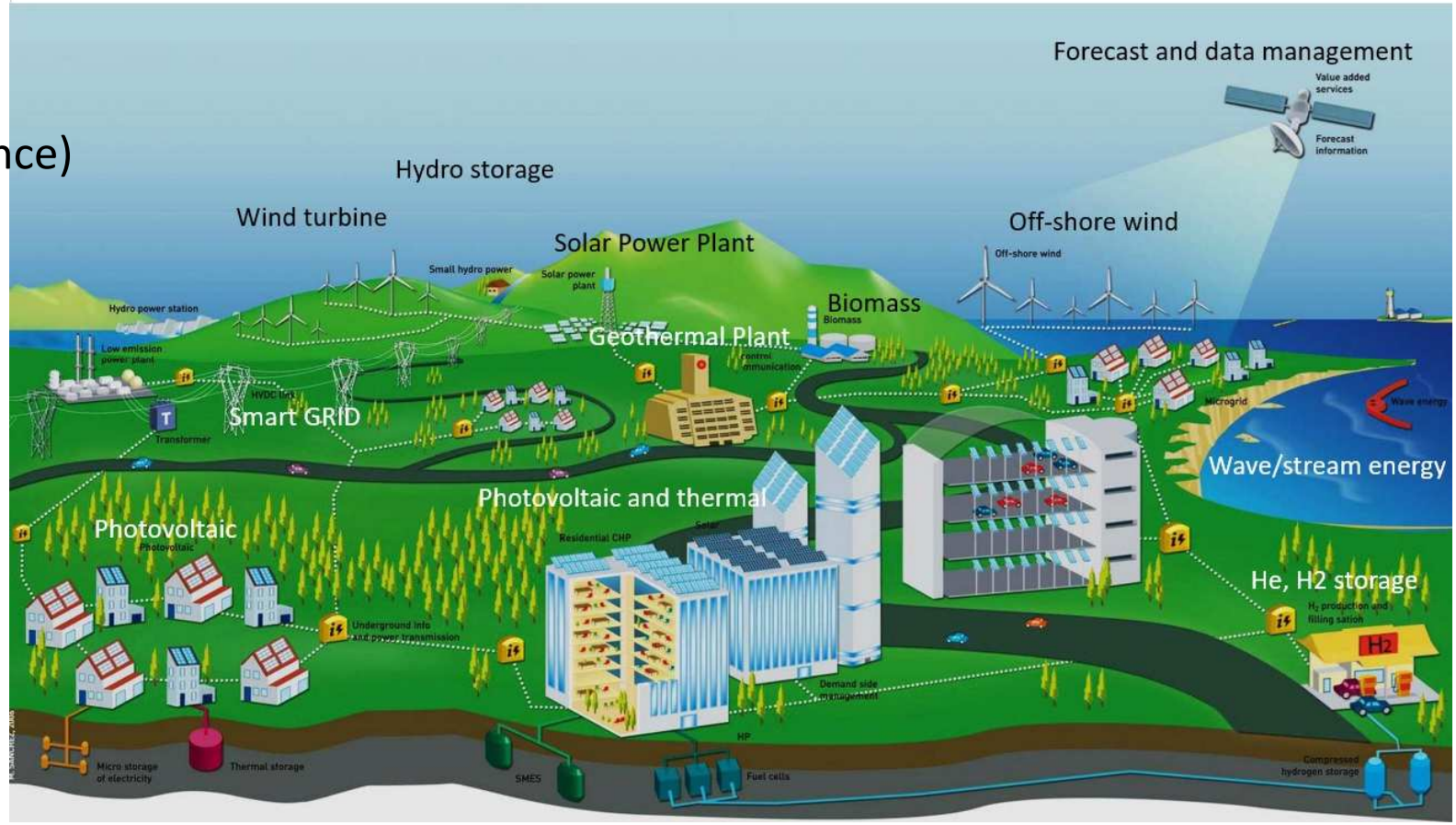
INTER-UNIVERSITY RESEARCH INSTITUTE CORPORATION
HIGH ENERGY ACCELERATOR RESEARCH ORGANIZATION



ILC Energy Center

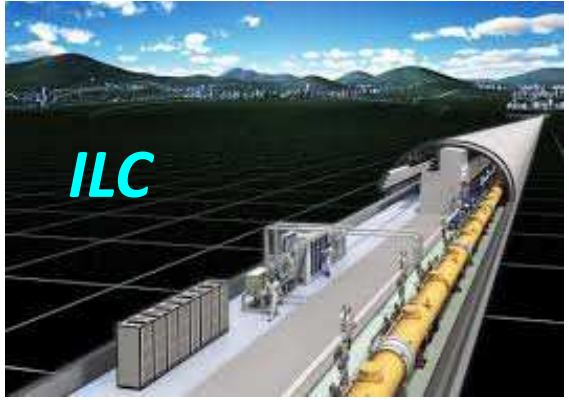


ILC center futuristic view



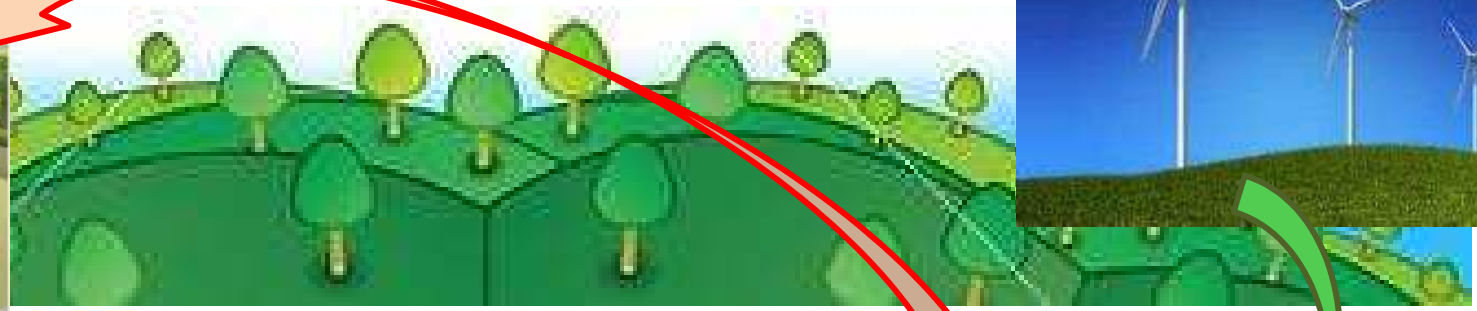
Denis Perret-Gallix
LAPP/IN2P3.CNRS (France)

GRID4EU
INNOVATION FOR ENERGY NETWORKS



4. Summary

Stand Alone Energy System, utilizing Natural Energy



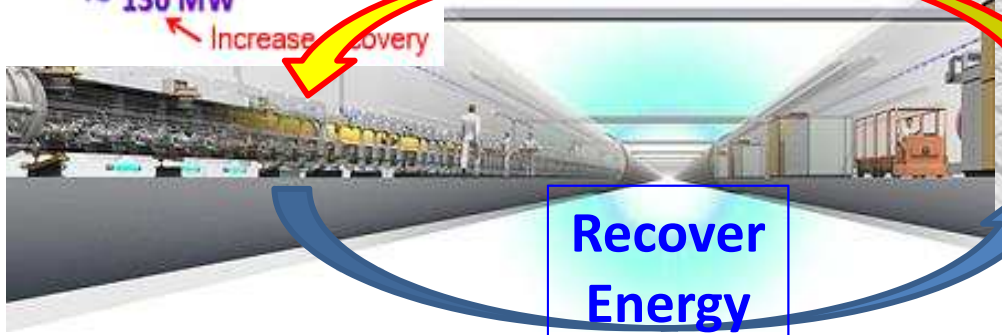
Reuse Energy

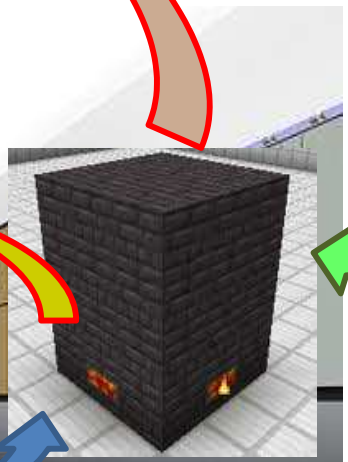
Ross Rate

Infrastructure : 50 MW	50 % : 25 MW
RF System : 70 MW	40 % : 28 MW
Cryogenics : 70 MW	100 % : 70 MW
Beam Dump : 10 MW	100 % : 10 MW
	~ 130 MW

Increase ... covery

Reuse Energy



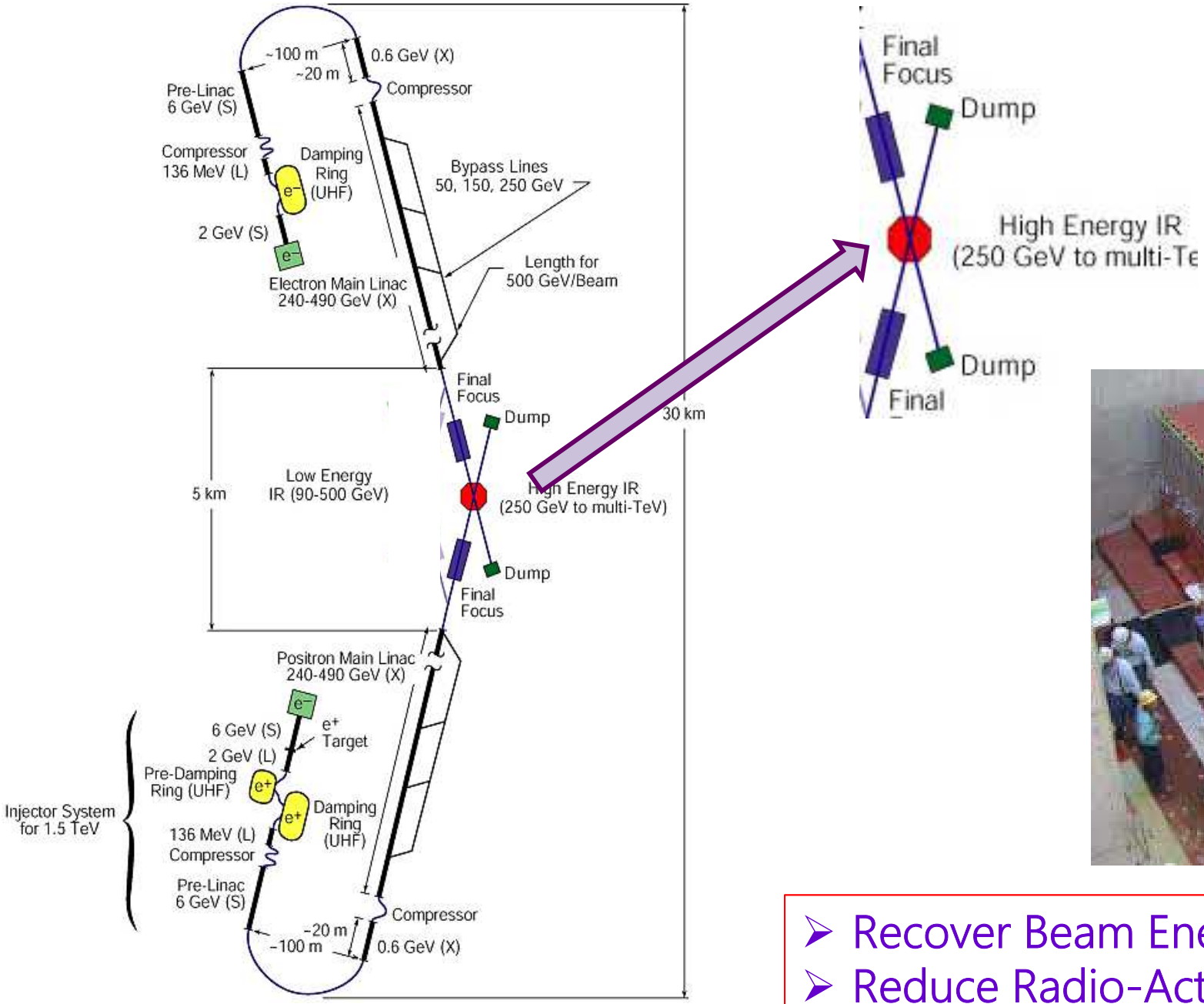


Improve Efficiency

Store Energy

Recover Energy

How to Recover Beam Dump Energy (～10 MW)



- Recover Beam Energy
- Reduce Radio-Activation

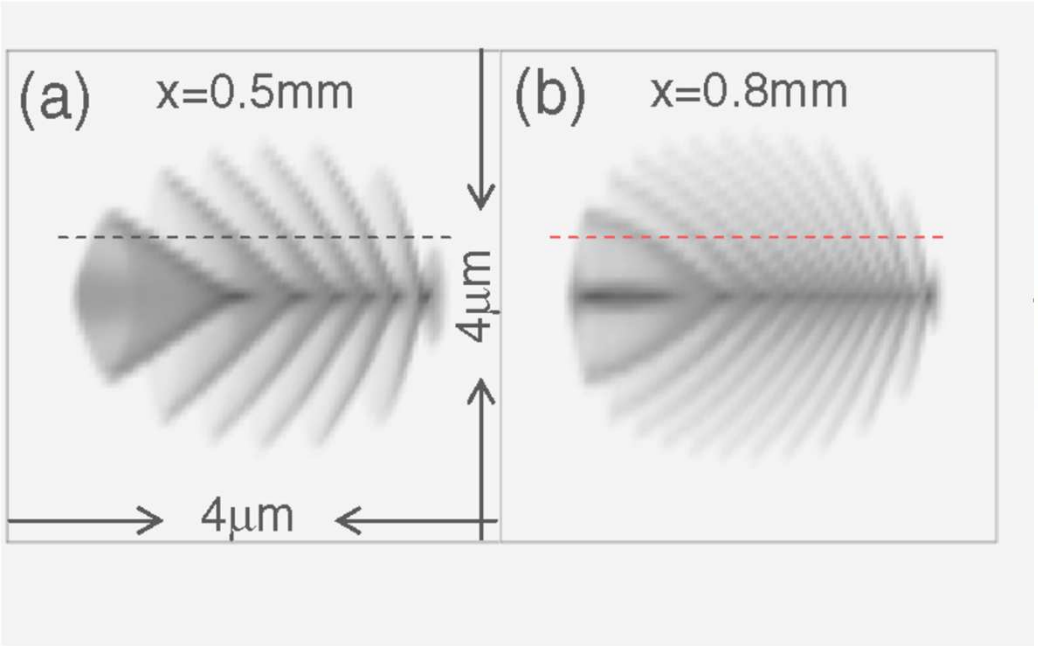
Plasma Deceleration Dumping

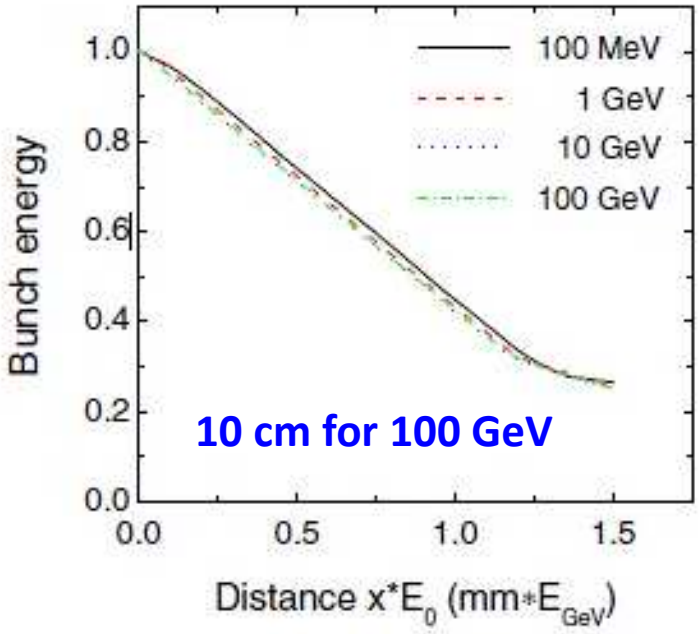
PHYSICAL REVIEW SPECIAL TOPICS - ACCELERATORS AND BEAMS 13, 101303 (2010)

Collective deceleration: Toward a compact beam dump

H.-C. Wu,[1] T. Tajima,[1,2] D. Habs,[1,2] A. W. Chao,[3] and J. Meyer-ter-Vehn[1]
[1]*Max-Planck-Institut für Quantenoptik, D-85748 Garching, Germany*
[2]*Fakultät für Physik, Ludwig-Maximilians-Universität München, D-85748 Garching, Germany*
[3]*SLAC National Accelerator Center, Stanford University, Stanford, California 94309, USA*
(Received 10 December 2009; published 5 October 2010)

Use Collective Fields of Plasmas for Deceleration





- The deceleration distance in the underdense plasma is 3 orders of magnitude smaller than the stopping in condensed matter.
- The muon fluence is highly peaked in the forward direction.

Collective Stopping Power for ILC

$$L_{dump}\,[\mathrm{m}] \approx 1.7 \times 10^{13} \frac{\sigma_T^2\,[\mathrm{cm}]}{N_b} E_0\,[\mathrm{GeV}]$$

here $\sigma_T \geq 0.6\sigma_L$ & $\sigma_T \geq 1.9 \times 10^{-6}\sqrt{N_b \sigma_L}$

(electron bunch)

ILC $N_b = 2 \times 10^{10}$ $E_0 = 500\mathrm{GeV}$

$$L_{dump}\,[\mathrm{m}] \approx 4.3 \times 10^5 \sigma_T^2\,[\mathrm{cm}]$$

$\sigma_T \approx 50\ \mu m$, $\sigma_L \approx 3\ \sigma_T \approx 150\ \mu m$

→ L = 10 m for Li gas

Next Trials

- Experiment of Proof-of-Principle for deposit mechanism of wake-field energy
- Development of how to recover wake-field energy

Green-ILC AAA-2014 Report

Advanced Accelerator Association Promoting Science & Technology

2014 AAA Green-ILC Working Group

2015.05.27

English Version

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4 Energy Saving Technology of Accelerator Device

Collector Power Depression (CPD) Klystron (Yoshio Kawakami, Toshiba-Electrontube) 23

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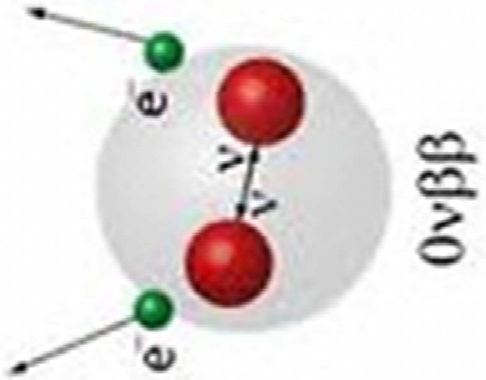
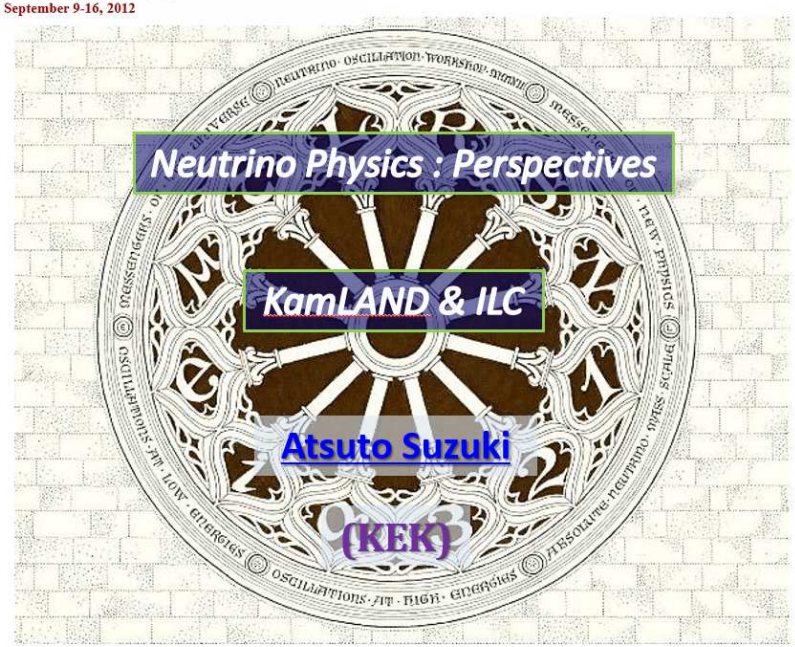
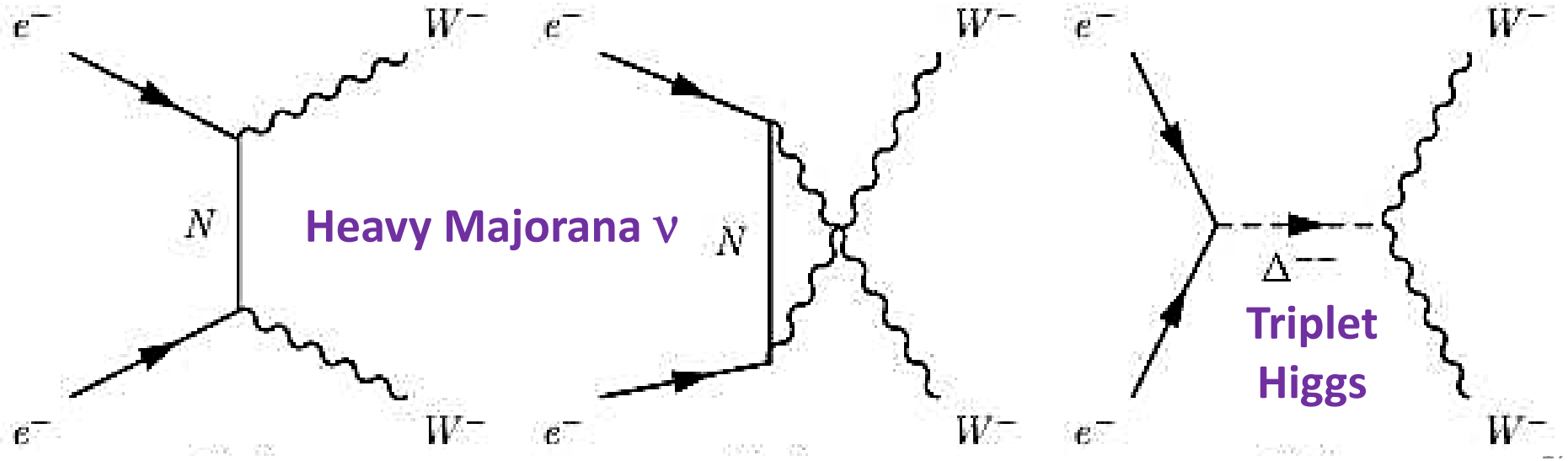
Physics with Denis

also with Fujimoto, Kurihara, Sugimoto, Ishikawa, KEK

Inverse Neutrinoless Double Beta Decay at ILC (International Linear Collider)

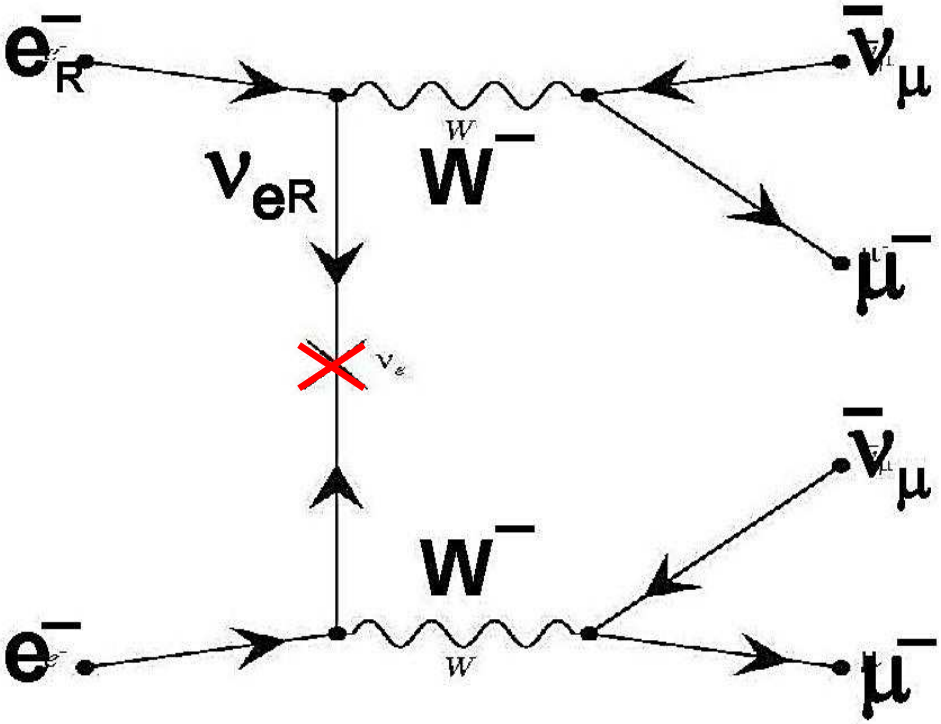




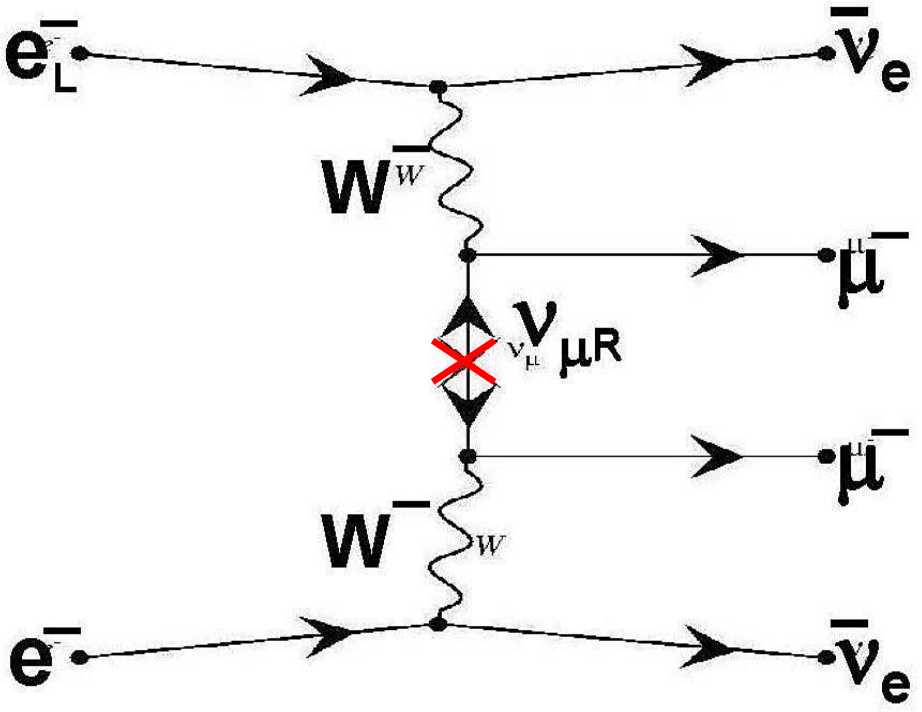


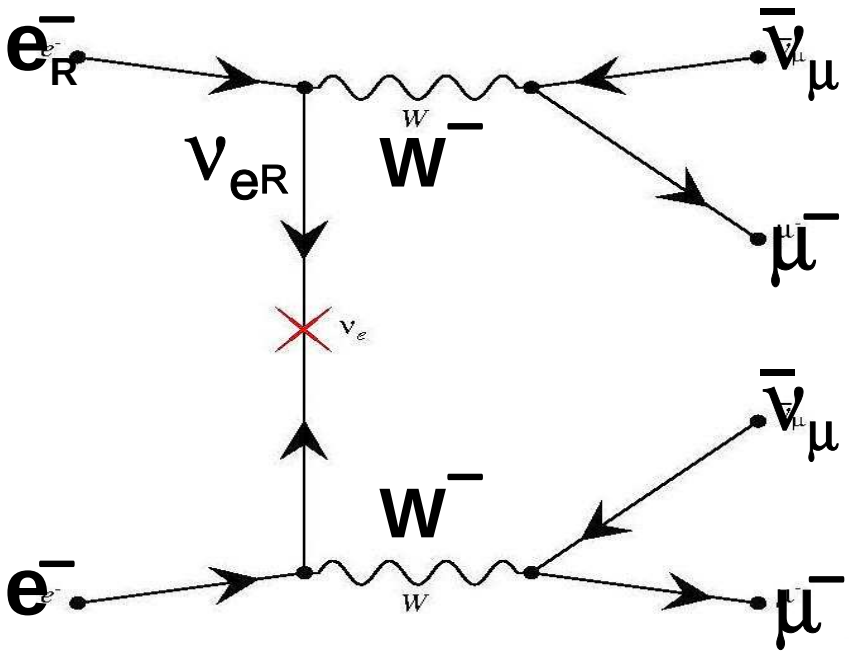
Beam Polarization : Discriminate 2 Reactions

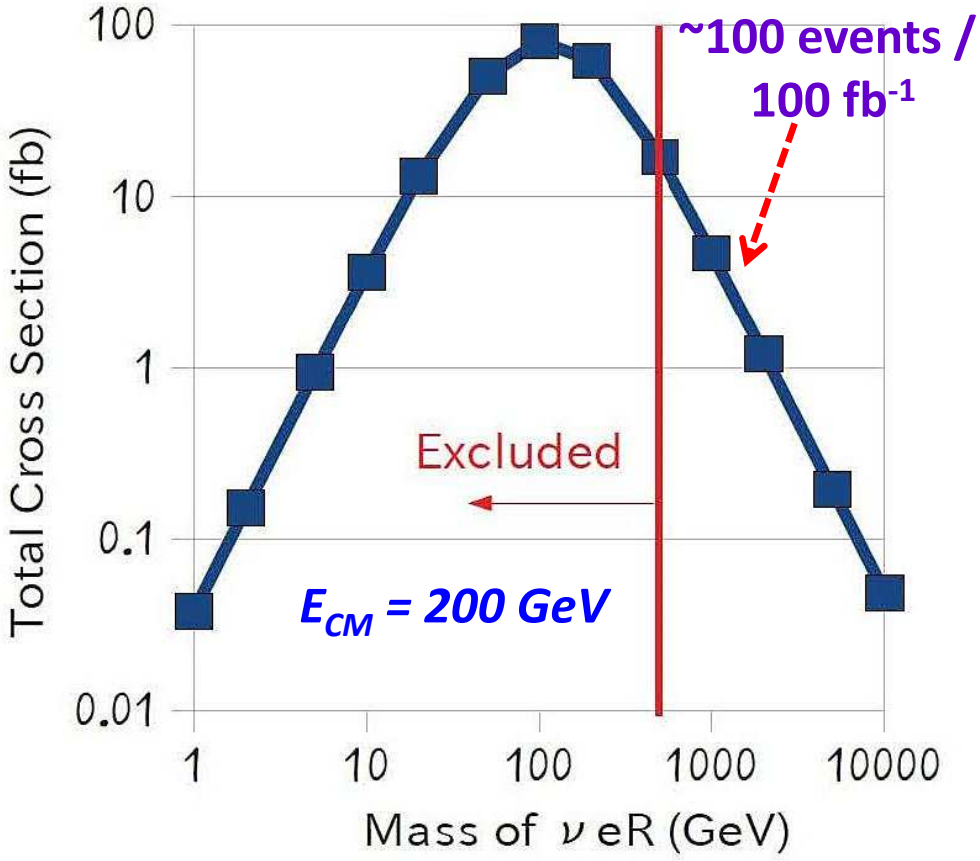
Right-Handed Polarized Beam



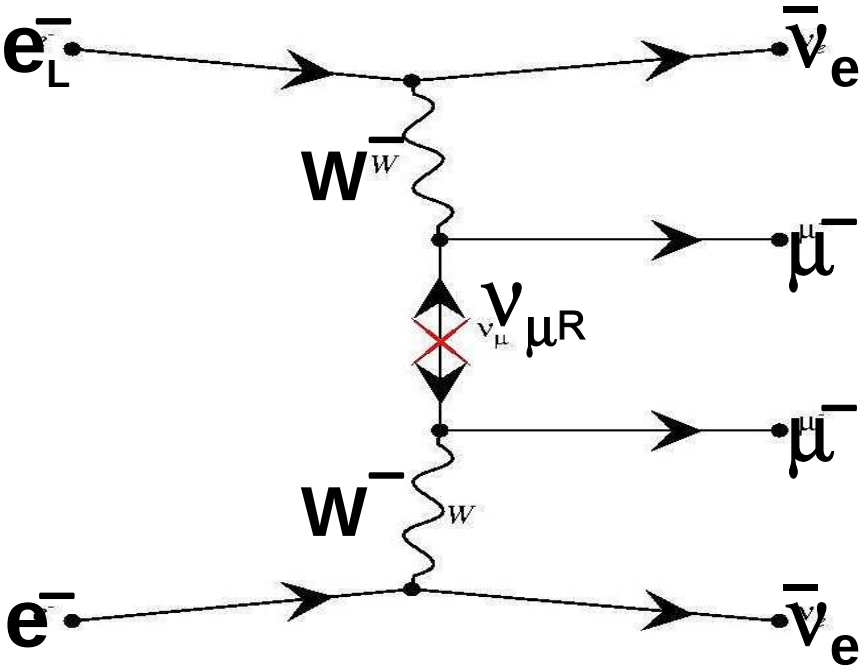
Left-Handed Polarized Beam

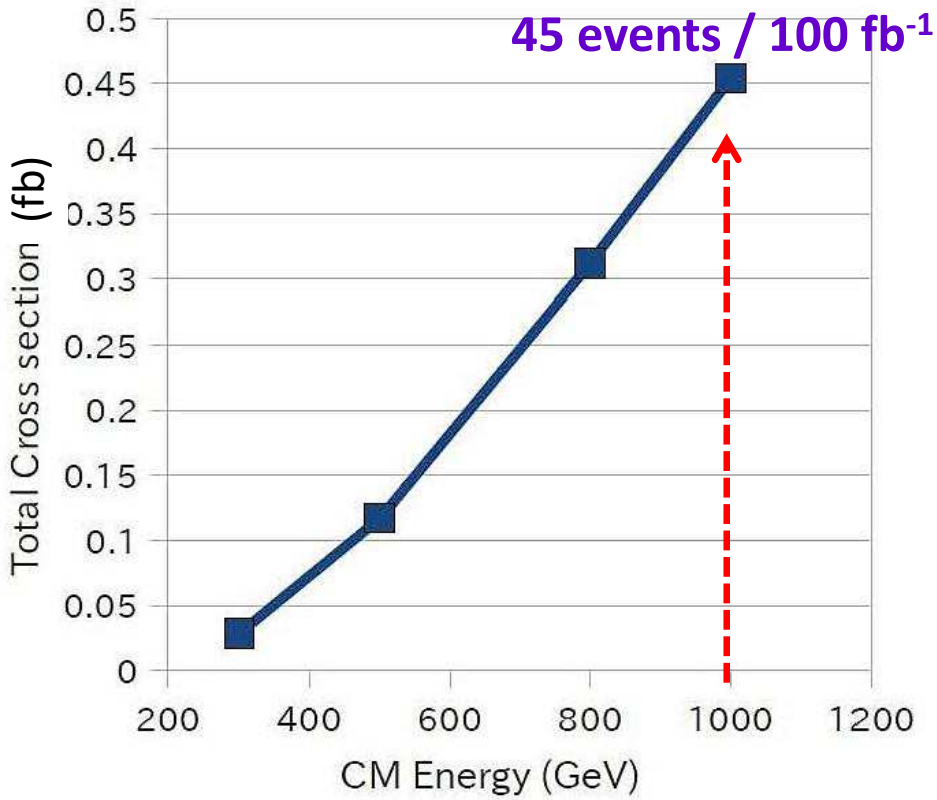






- A W^- pair-production occurs through a right-hand electron-neutrino.
- A CM-energy is 200 GeV.
- Cut:$30^\circ < \theta_\mu < 150^\circ$, $E_\mu > 10$ GeV
- We assume a signal is background-free.
- Total cross sections in fb are shown in Figure .
- We can expect about 100 events for 1 TeV ν_{eR}-mass after accumulating 100 fb^{-1}.





- A W^- pair-production occurs through a right-hand muon-neutrino
- A mass of a right-hand muon-neutrino is set to be the same as a W-boson mass.
- Cut:$30^o < \theta_\mu < 150^o$, $E_\mu > 10$ GeV
- We assume a signal is background-free.
- Total cross sections in fb as a function of a CM-energy are shown in Figure
- We can expect about 45 events at a CM-energy of 1 TeV after accumulating 100 fb^{-1}.

We really lost a strong pillar,
bridging between
France and Japan.

We pay our last respects
to Denis.