

ILC A CLIC

SOUČASNÁ SITUACE

TOMÁŠ LAŠTOVIČKA
(FZÚ AV ČR)

SETKÁNÍ CZ HEP KOMUNITY

MFF UK

11. BŘEZNA 2014



LCC NA 1 PRŮSVITKU

- V současné době LCC kolaborace (Linear Collider Collaboration) celosvětově zastupuje oba projekty, tedy jak ILC tak CLIC.
- Založeno v únoru 2013, ředitelem je Lyn Evans.
- Zastupuje komunitu zhruba 2000 vědců a techniků.
- FZÚ je členem CLICdp kolaborace
 - CLICdp = detektory a fyzika
 - Zastoupení v Institute Board (TL)
- Zároveň přispíváme do ILC přes kolaboraci CALICE a dříve též přes LCFI kolaboraci.
 - V ILC se hnuly ledy a Japonsko učinilo zásadní kroky pro vybudování ILC tamtéž.



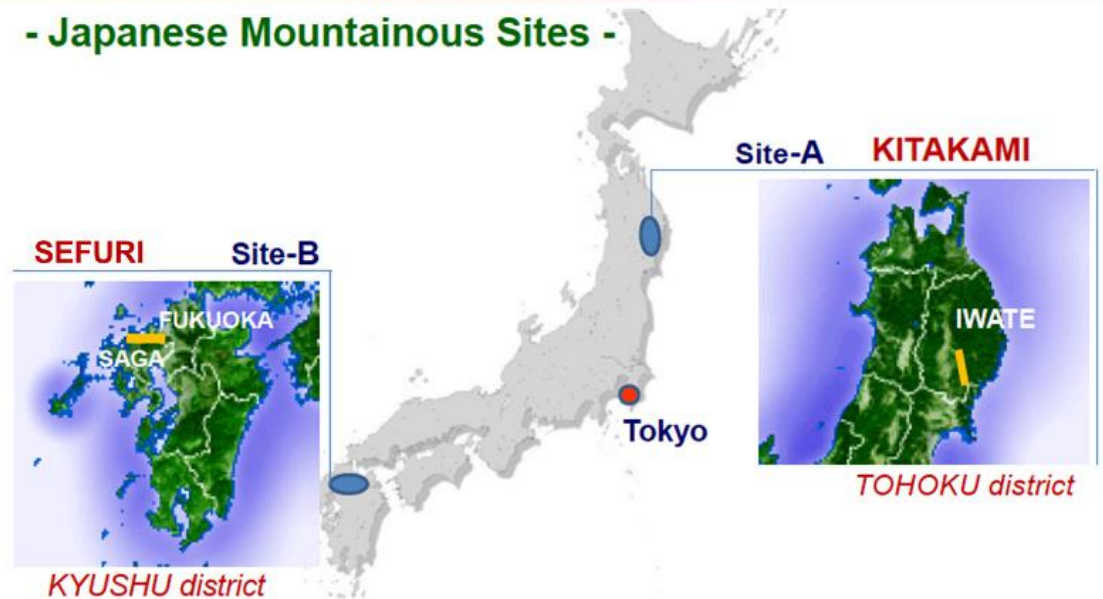
OSLÍ MŮSTEK



JAPONSKO – VÝBĚR LOKACE

- Dvě místa byla před-vybrána, obě v hornatých lokacích
 - SEFURI (Jih)
 - KITAKAMI (Sever)

- Japanese Mountainous Sites -

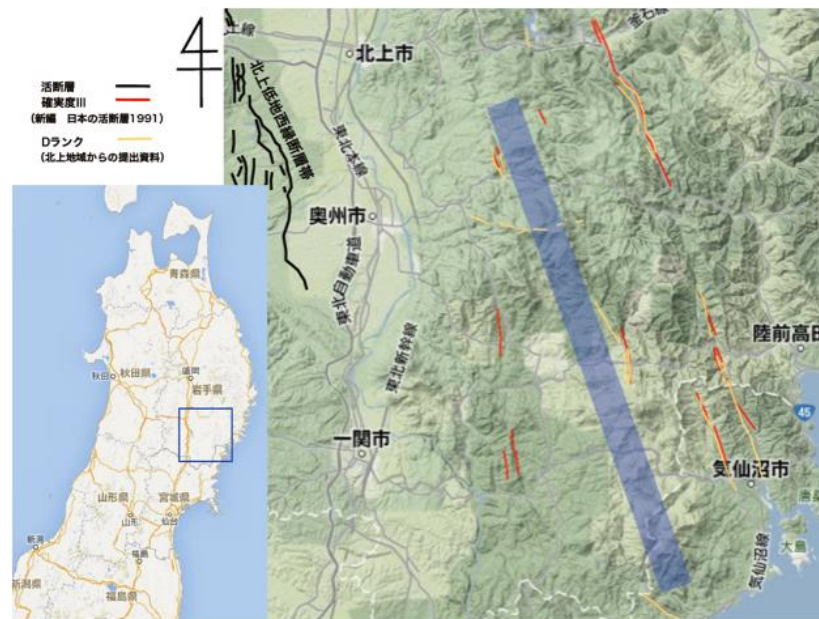


“Issues that could lead to particularly serious difficulties for the Sefuri site are that the route passes under or near a dam lake, and that the route passes under a city zone. Also, the lengths of access tunnels are longer for the Sefuri site than for the Kitakami site leading to a large merit for the latter in terms of cost, schedule, and drainage.”

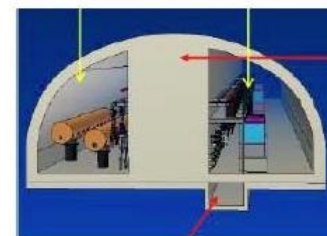
→ KITAKAMI

Zleva: Sachio Komamiya (Tokyo), Satoru Yamashita (Tokyo), Kiyotomo Kawagoe (Kyushu), Hitoshi Yamamoto (Tohoku), Mike Harrison (Brookhaven), Brian Foster (Oxford)

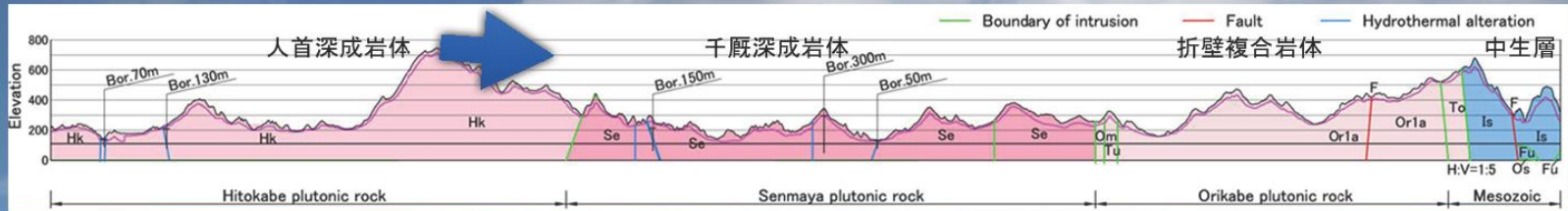
JAPONSKO – KITAKAMI SITE



- Hornatá oblast poblíž **Ichinoseki**
 - 200 m až 700 m nad mořem
 - Dominantně granit, stabilní podloží
 - zhruba 5h z letiště **Narita**
 - 1 hodina ze **Sendai**



KITAKAMI SITE



IP (~12km away)



ILC CENTRÁLNÍ KAMPUS – KONCEPT Z KVĚTNA 2013

80 hektarů (kompaktnější varianty mají cca 40 hektarů)



residence buildings, assembly halls, central buildings

100 000 m² floor area



学術会議答申

。。。。前文

- ・ 日本学術会議としては以上の観点から、ILC 計画の実施の可否判断に向けた諸課題の検討を行うために必要な調査等の経費を政府においても措置し、2～3年をかけて、当該分野以外の有識者及び関係政府機関も含めて集中的な調査・検討を進めること、を提言する。
- ・ ILC の我が国への誘致の判断には、本回答が提示する諸課題や懸念事項について十分な調査・検討が行われ、建設、運転、高度化、最終処理にわたる経費の全容とその国際分担、人材や管理運営体制の問題など課題事項に対して明確な見通しが得られることが必須である。
- ・ 調査・検討と並行して海外主要国・地域の研究機関や資源配分機関との協議を行い、国際分担等に関する見極めを行うべきである。
- ・ ILC 計画を我が国で実施し高い成果を挙げるための諸条件を余すところなく検討した上で、学術コミュニティ全体の合意形成、さらには国民の理解を求めることが必要である。

SCIENCE COUNCIL OF JAPAN

(Satoru Yamashita - private translation)

- Based on the viewpoints above, *the Science Council of Japan proposes that the Japanese Government funds budget for the necessary investigations* on various issues in order to judge as Japan for the realization of the ILC project, and for 2 to 3 years intensively conduct investigations involving experts from outside the field and corresponding Government bodies.
- In deciding to host the ILC in Japan, it is indispensable that the issues and concerns raised by this report are fully investigated and reviewed, and clear prospects are obtained for questions such as the whole pictures of project cost for the construction, operation, upgrades, up to the final disposition and the prospects of international cost sharing thereof, as well as issues of sharing of human resources, and international governance structure.
- In parallel with the above investigations, negotiations should be conducted with research laboratories and responsible funding authorities of primary countries and regions to clarify the prospects for the international cost sharing.
- Upon fully examining the various conditions for the ILC project in Japan and to be highly successful, it is important to form an academic community and to seek understanding of the

50:50 (Jap:Svět)

\$7 miliard (bez R&D, pozemků atd.)

+\$2 miliardy za tunely, inž. síť

Vše dohromady až cca \$20-30 miliard.

JAPANESE BUDGET ALLOCATION IN 2014

(Hitoshi Murayama)

- On Dec 24, Japanese cabinet has released the government budget proposal for JFY 2014 which will be voted on in Diet early next year. *It includes an official budget line for the ILC.* This is highly important as it represents a qualitative change in the status of the ILC in the Japanese government and indicates that it is now a recognized project.
- Part of “the economic growth strategy” which is a reference to “Abenomics”, a proactive economic policy by Prime Minister Shinzo Abe.
- The amount itself is small, about \$500K. However, this is highly significant symbolically, as the ILC is ***recognized*** as a project of the Japanese government.
 - Note that this is ***not*** an R&D budget, which is supported through KEK.
 - It is rather a specific budget for the Japanese government to seriously study the feasibility of an international framework for the ILC as a global project (2-3 years?).

SITUACE VE SVĚTĚ

▪ **Evropa** (Brian Foster)

- Dominuje převážně Německo
- Dlouhodobý pokles FTE, ale náznak obratu v souvislosti s “ILC in Japan”
- Vyčkávání na jasný signál Japonské vlády:

A statement from the Japanese government that they wish to negotiate to site ILC in Japan is essential.

▪ **USA** (Harry Weerts)

- **Snowmass** 2013 proces (= věda) ukončen a ILC doporučeno
- **P5** proces – plán na postup USA v HEP v rámci 10 let
- V květnu bude rozhodnuto.

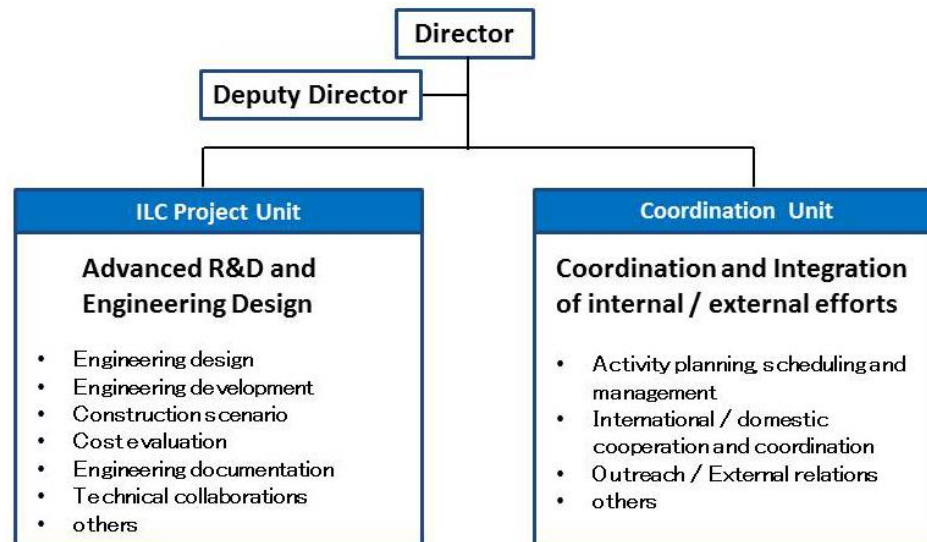
▪ **Asie** (Akira Yamamoto)

- kromě Japonska
- Převážně zapojení do RF technologie kavit
- Čína, Korea, Indie, ...

- Průzkum MOFA v roce 2013, ohledně mezinárodní podpory, byl “zklamáním”.

UPDATE ZA ROK 2014

- Japonská vláda ma nyní kancelář speciálně pro ILC a pro přípravu vyjednávání na mezivládní úrovni
 - Speciální rozpočet pro ILC byl schválen dolní směrovou 28. února 2014.
 - Rozhodnutí o stavbě padne do dvou let.
 - Začala/začínají probíhat jednání na mezinárodní úrovni.
- KEK založil tzv. “ILC planning office”
<http://legacy.kek.jp/intra-e/info/2014/020617/>



VÝRAZNÁ LOKÁLNÍ AKTIVITA (POSTERY, DVD, KOMUNIKACE...)



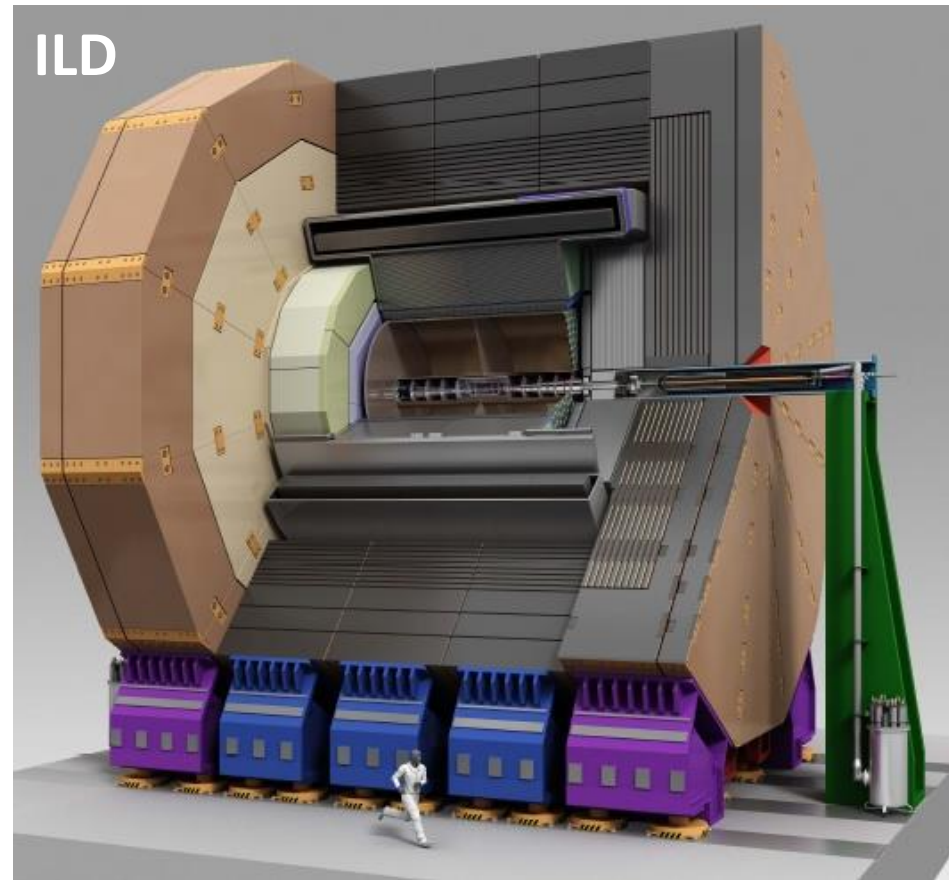
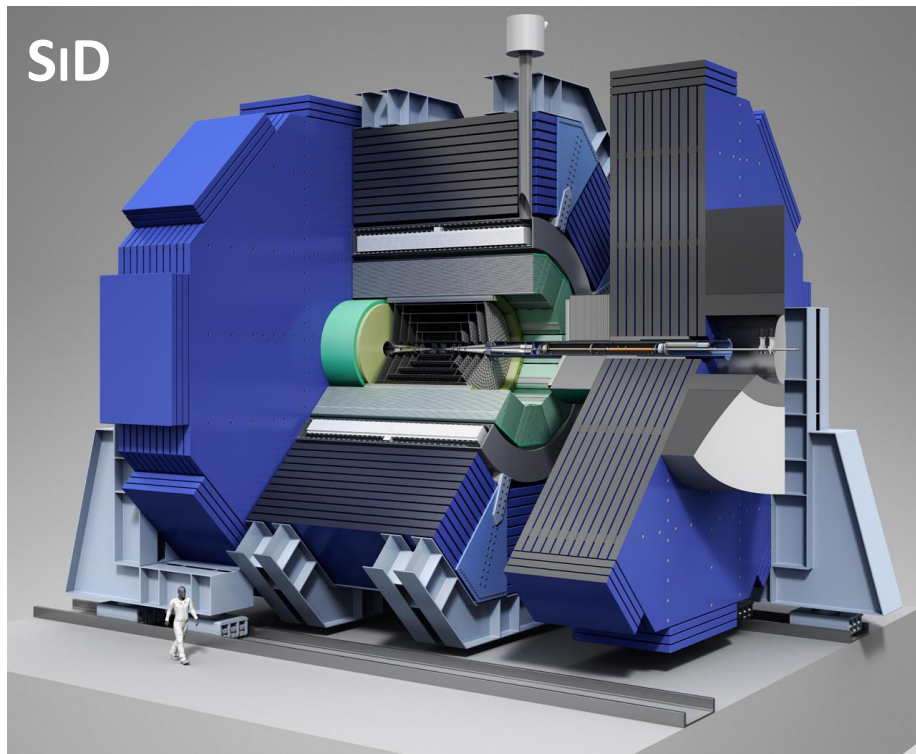
MEZINÁRODNÍ JEDNÁNÍ S ČESKOU REPUBLIKOU

- Zatím žádné neprobíhá.
- Kontaktem na Japonské ambasádě je zřejmě první sekretář pan Mitsuru Kameya (sekce pro ekonomické záležitosti).
- Bylo by vhodné být předem připraveni a mít rozmyšlené, jaká by byla naše účast v projektu a jak by budoucí jednání mohla vypadat. Konkrétněji
 - kontakty na CZ straně
 - účast v kolaboraci v rámci ILC (urychlovač, detektory: **ILD**, SiD)
 - forma našeho příspěvku a jeho výše
 - finanční zdroje
 - ...

BACKUPS

TWO DETECTOR CONCEPTS SiD AND ILD

- SiD (USA), ILD (merging former EU and Asian concepts LDC+GLD)
- 5T field in SiD vs 3.5T for ILD



- Tracker radius: 1.2m (SiD), 1.8m (ILD).

LCC STRUCTURE

International Committee for Future Accelerators

ICFA

Funding Agencies for Large Colliders

Program Advisory Committee

Linear Collider Board

FALC

Regional Directors
Brian Foster (Europe)
Harry Weerts (Americas)
Akira Yamamoto (Asia)

Directorate
Lyn Evans

Deputy (Physics)
Hitoshi Murayama

ILC
Mike Harrison

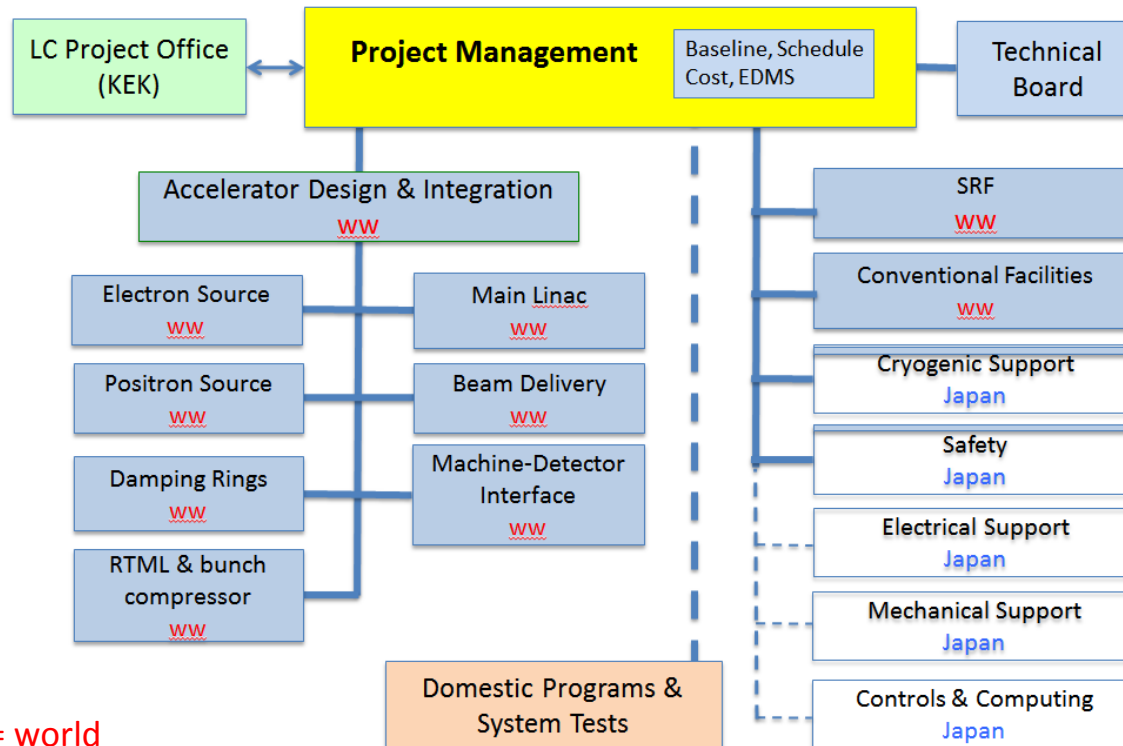
CLIC
Steinar Stapnes

Physics & Detectors
Hitoshi Yamamoto

LCC

ILC RE-ORGANIZATION

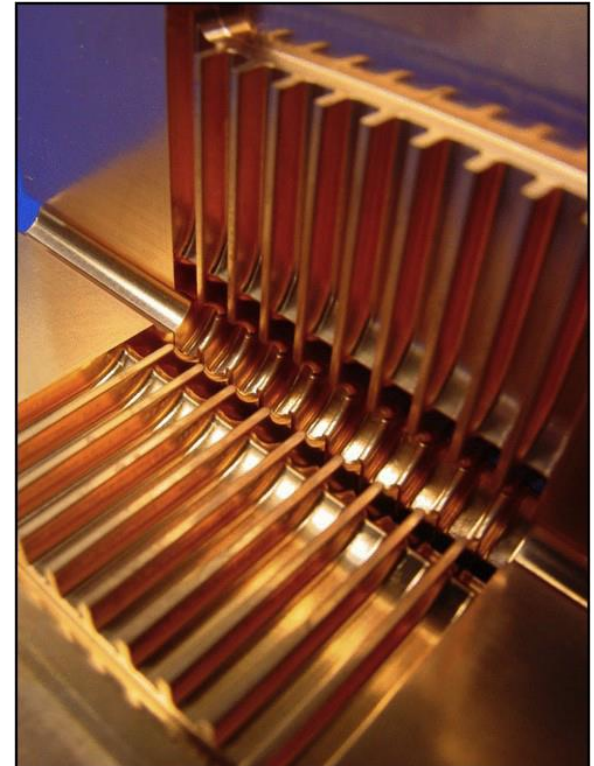
- Try to establish an organization that can evolve into a construction project in a reasonable way – a virtual *prelab*.
- Allow for a more continuous work flow. Since the end of the GDE the accelerator effort has essentially been centered around workshops.
- Boxes are populated incrementally as resources permit:



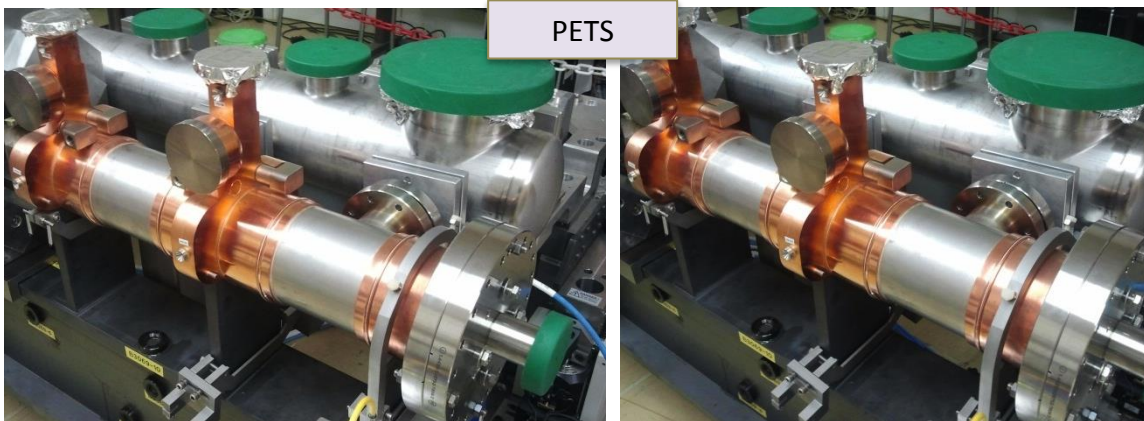
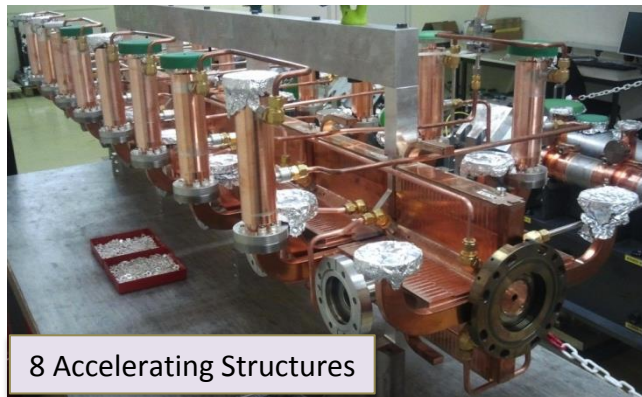
CLIC ON ONE SLIDE

Center of mass energy	350 GeV	1.4 TeV	3 TeV
Bunch spacing	0.5 ns		
Bunches per train	354	312	312
$\gamma\gamma \rightarrow$ hadrons per BX	0.3	1.3	3.2

- Multi-staged approach
 - 350 GeV stage motivated by better luminosity and sizeable WW fusion cross section (vs. 250 GeV ILC)
- CLIC will be operated at room temperature
- 100 MV/m gradient enabling multi-TeV CME
- Pre-collaboration state
 - FZÚ signed MoC with CLICdp (Detectors and Physics)
 - Member of Institute Board (TL)
- CDR published in 2012/2013
<http://clic-study.org/accelerator/CLIC-ConceptDesignRep.php>

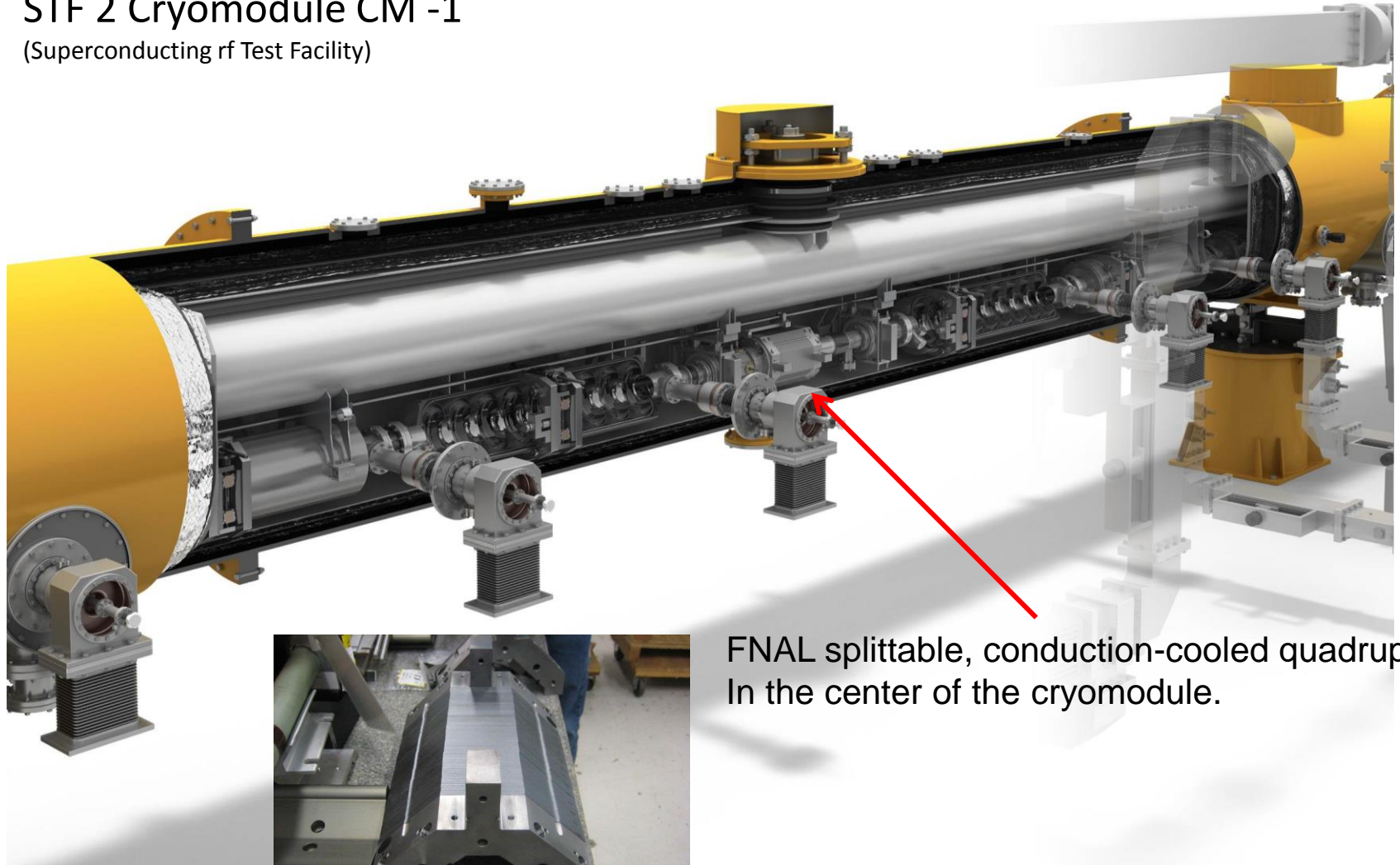


FABRICATED RF MOCK-UPS



ILC 8 CAVITY WITH QUADRUPOLE CRYOMODULE

STF 2 Cryomodule CM -1 (Superconducting rf Test Facility)



FNAL splittable, conduction-cooled quadrupole,
In the center of the cryomodule.

