

Message from Asian Linear Collider
Steering Committee (ALCSC)

Tohoku University
Sendai, Japan

March 3, 2008

Won Namkung, PAL

- *ALCSC is an Ad hoc Committee under ACFA.*

- *It represents ACFA to ILCSC and coordinating to ILC-Asia Regional Office.*

- *Prof. Shin-ichi Kurokawa is elected as the ALCSC Chair in February, 2008*

ILC-related Collaboration in Asia

- ***ILC-Asia MOU (2005)***

*CAT (Indore, India), CHEP(Daegu, Korea), IHEP(Beijing, China),
KEK (Tsukuba, Japan), PAL (Pohang, Korea), TIFR (Mumbai, India)*

- ***ATF-MOU (2005)***

*IHEP, PAL, Tokyo, Kyoto, Nagoya, Waseda, KEK, SLAC, FNAL, LBNL,
Cornell, CERN, DESY, Q.M.U.L., R.H.U.L, Oxford, U.C.L,*

- ***Core University Program (CUP) in Accelerator Science (2005):***

*Multi-lateral Program for 4 countries on Man-power training,
exchanges, schools and Seminars*

*China (IHEP, C. Zhang), India (RRCAT, S. Krishnagopal)
Japan (KEK, S. Kurokawa), Korea (PAL, I. S. Ko)*

Visitors to KEK in 2007 (person-days)

- *Korea: 591*
- *China: 329*
- *India: 180*
- *Taiwan: 90*
- *Other Asian: 31*

(Ref. Yokoya's Presentation at CCAST Workshop in Beijing on Oct. 5, 2007)

Asian Work for STF at KEK

- *Cryo-module design: IHEP*
- *Coupler design: IHEP*
- *9-cell cavity: PAL*
- *LL single cell: IHEP*
- *Cold BPM: PNU*
- *Cavity design/processing: KNU, PNU*

(Ref. Yokoya's talk at CCAST Workshop in Beijing on Nov. 5, 2007)

For GDE EDR-Phase (2007~2010)
(to be revised)

- ***GDE EDR-MOU:***
 - *Prepared by ILCSC in February, 2008*
 - *Work Packages for Engineering Design and R&D*
 - *To assist government level commitments*
 - *To promote outreach programs, such as publishing RDR-companion document in Chinese, Japanese, and Korean*

- ***Strategy for Asian HEP:***
 - *To reactivate the Subcommittees, taking into account of GDE and KEK Timelines*
 - *To promote Asian-MOU, ATF-MOU, and CUP, ALCSC Office at KEK*

ALCSC: Regional Representatives (in Feb. 2008)

Shin-ichi Kurokawa (KEK, Tsukuba), Chair

W. Namkung (PAL, Pohang), Vice-Chair

Jie Gao (IHEP, Beijing), Vice-Chair

G. Taylor (U. Melbourne, Melbourne)

Rohini Godbole (IISc, Bangalore)

Satoru Yamashita (U. Tokyo, Tokyo)

H. B. Park (KNU, Daegu)

Y. B. Hsiung (NTU, Taipei)

L.H. Khiem (IOP, Hanoi)

Angelina Bacala (MSU-IIT, Mindanao)

Brief Summary/Status on ILC R&D

- Japan: (Ref. to next talk by Prof. A. Suzuki, KEK DG)
- China: J. Gao
- India: V. C. Sahni
- Korea: E. S. Kim



China's (IHEP) Efforts in ILC Collaboration

J. GAO

IHEP, CAS, Beijing

CCAST ILC Accelerator Workshop and 1st Asia ILC R&D Seminar

Nov. 5, 2007, IHEP, Beijing, China

TILC08/Sendai, W. Namkung, March 3, 2008

- 1) **ILC-IHEP** (China) has made progresses in ILC collaboration.
- 2) In addition to regional collaboration (with **KEK**, etc), intercontinental collaboration is very important also and welcome, for example with **LBNL** on ILC damping ring and with **Fermi Lab** on SC RF technology.

IHEP collaborates with France under **FCPPL** on ILC in ATF2, high power coupler and positron source.

IHEP will start its collaboration on ILC with **SLAC** next year.

IHEP ILC will strengthen its collaboration with ANL on relevant subjects, such as damping ring, SC RF, positron source, etc.

Summary for ILC-India R&D Status

February 21, 2008

By

V. C. Sahni

R R CAT
Indore, India

TILC08/Sendai, W. Namkung, March 3, 2008

Trials for making 1.3 GHz cavity forming dies/machining fixtures



Loading arrangement of dies on the 200 Ton Hydraulic Press at RRCAT



Blank Loading for Forming

Half cups of finally formed parts of cavity



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Frequency & E-Field Measurement on Trial 1.3 GHz Cu Cavity

Trial Prototype Elliptical Cavity Made of Two Cu Half Cells



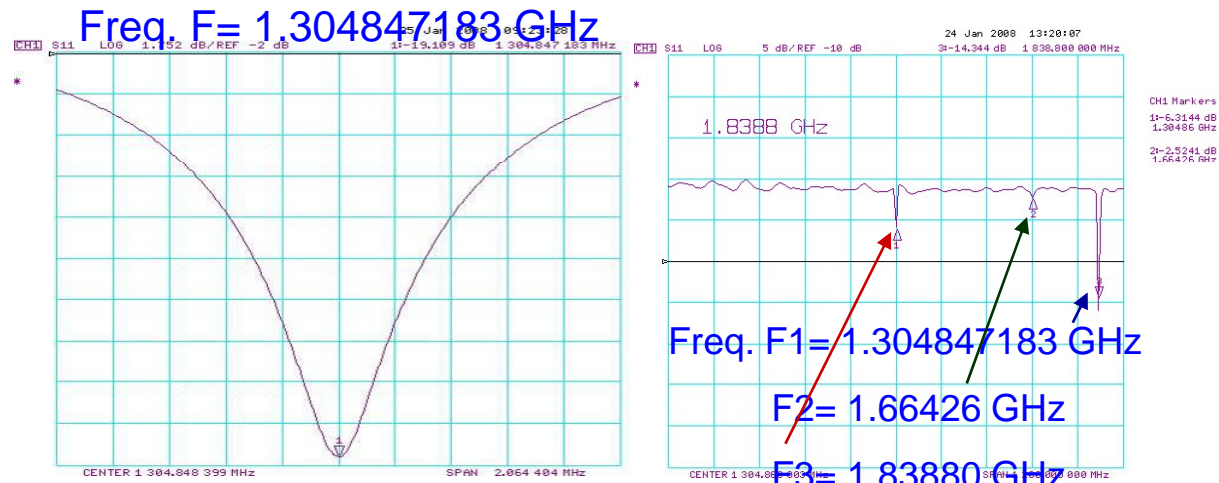
2 Half Cells+ beam pipe & Flanges



Bead Pull Measurement Setup for Assembled Cavity

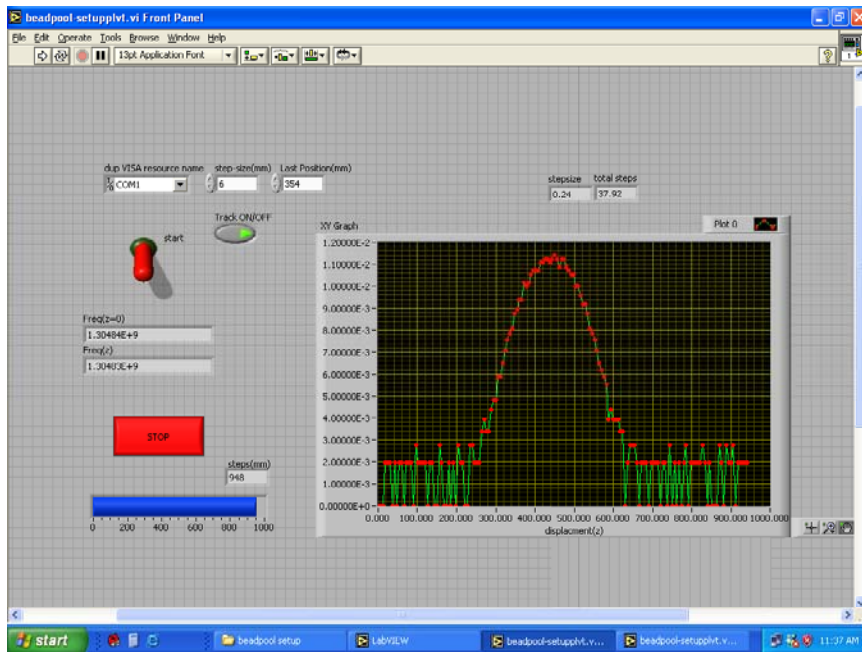


Assembled Cavity with beam pipe & Flanges

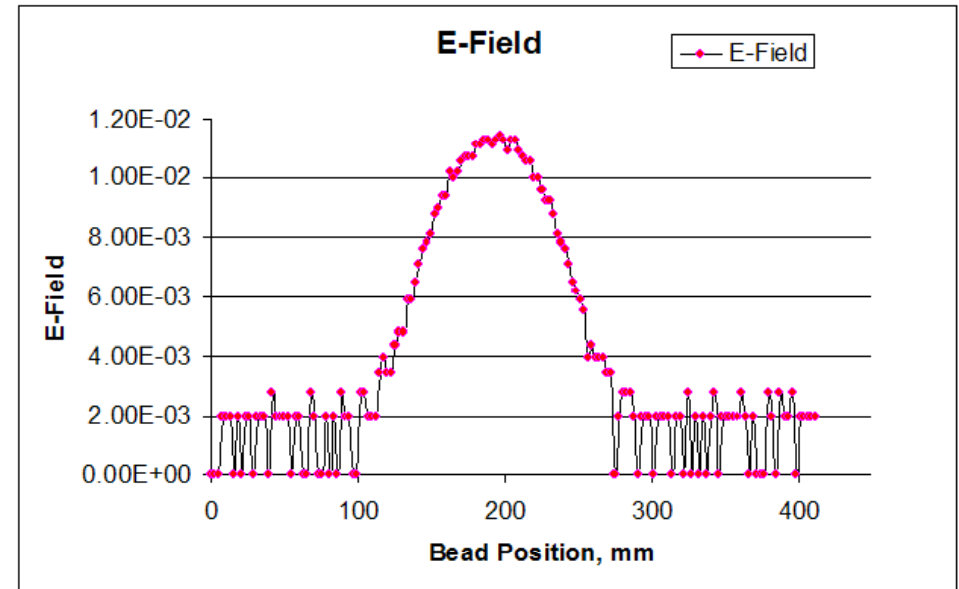


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Screen Shot of Bead Pull Measurement Program



Plot of Measured E-Field Distribution in the Cavity Using Bead Pull Measurement



Frequency: Computed ANSYS

- 1302.0228 MHz

SUPERFISH

- 1301.3937 MHz

CST (MWS)

- 1299.4400 MHz

Measured using VNA

- 1304.847183 MHz

Q Value Computed: ANSYS

- 30136

SUPERFISH

- 29520.8

CST MWS

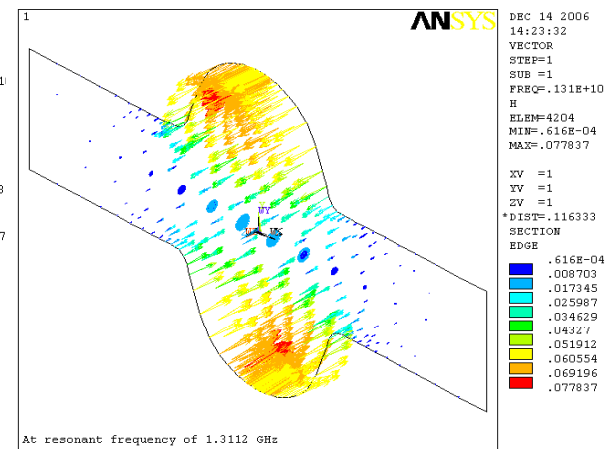
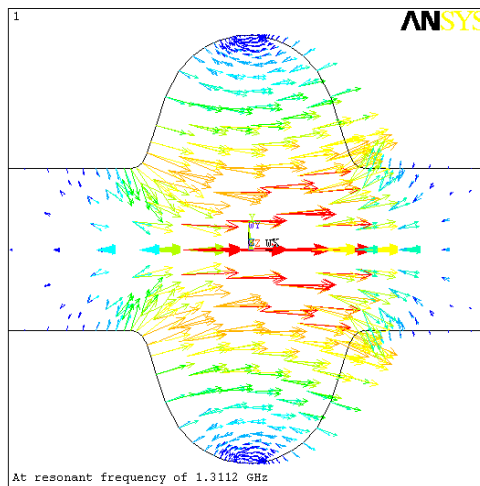
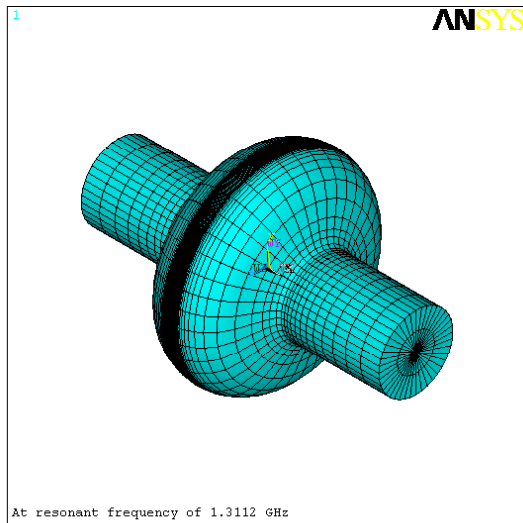
- 25621.2102

Measured Q Value

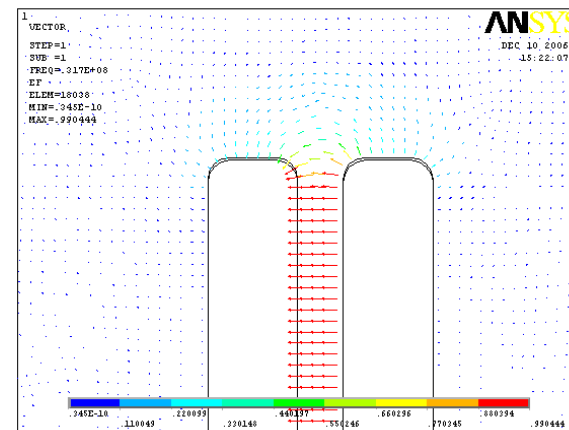
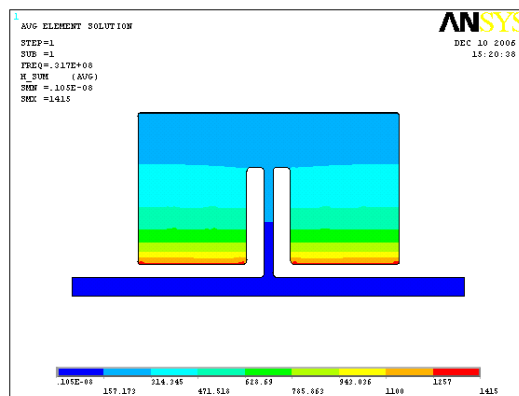
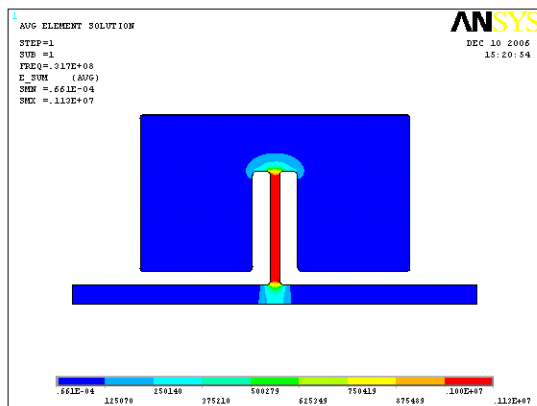
- 6990 (Low because of poor contact)
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Simulation of Fields in RF Cavities

1.3 GHz Cavity



31.6 MHz Indus-1 Cavity



Scheme for Qualifying Niobium & Other Materials for Reproducible Production of Superconducting RF-Cavities Giving High Accelerating Gradients (New Patent was filed in Oct 07 by S. B. Roy & V. C. Sahni, RRCAT, Indore)

*Current approach to material qualification for SC-RF cavities mainly relies on improving the residual resistivity ratio (RRR) of the SC.

Involves expensive Niobium refinement process.

*With high RRR Nb + right cavity shape + BCP/EP treatment \Rightarrow Extrinsic (+ surface) defects are low & so multipacting reduces.

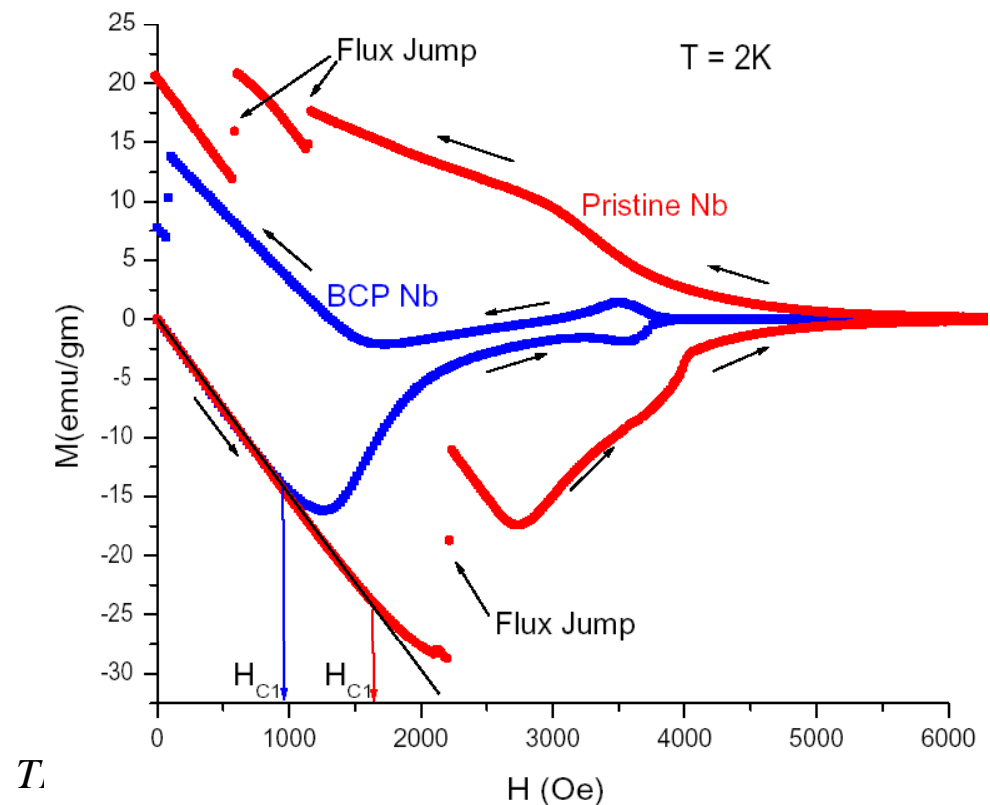
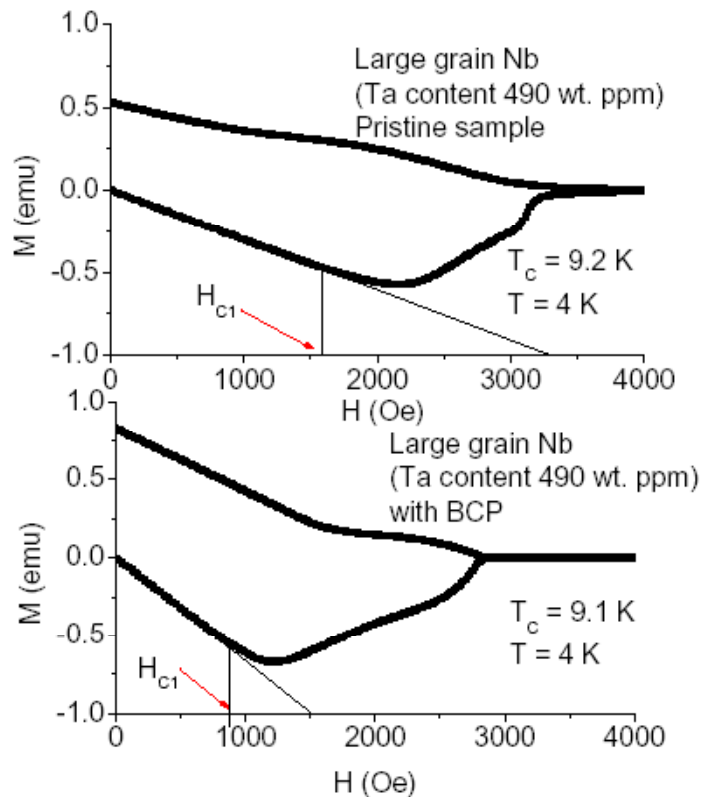
*But high RRR does not say how good are the SC properties of Nb & at best gives indirect information on thermal conductivity.

***All cavities fabricated in the same way don't give high gradients.**

***So a better qualification scheme is needed using HCl since that sets an upper limit on achievable SC-RF accelerating gradients.**

Main content of patent: Provide a material ‘qualification scheme’ involving the measurements of **HC1** and **thermal conductivity** to ensure that most of the SC-RF cavities give high gradients.

Figures below show how chemical treatment can affect HC1: Two large grain Nb- samples -one pristine & other a bcp treated. Gradients in these cavities correlated strongly with HC1 values.



ILC accelerator related R&D in Korea (KNU - PAL - PNU)

Nov. 5 2007

@ 1st Asia ILC R&D Seminar (IHEP)

KNU

Eun-San Kim

TILC08/Sendai, W. Namkung, March 3, 2008

Summary

□ R&D for EDR at Korea

- ✓ RTML - Alternative bunch compressor
- ✓ DR - Lattice / Instabilities
- ✓ BDS - BPMs and Jitter study for ATF2
- ✓ SRF - Cavity processing and analysis
 - Cavity testing facility
- ✓ HLRF - IOT

□ Many collaborations in ATF2 / Cavity with KEK

□ Collaborations with other labs. are also growing.

- ✓ L-band BPM for ML
- ✓ Multipurpose control board for Modulator
- ✓

Korean government
announced to establish

“Large-scale Science Support Department”
in the new

“Ministry of Education, Science and Technology.”

on

Feb. 29, 2008