Chinese Industry for CEPC (2019 Summary)

CEPC Industrial promotion Consortium（CIPC）

2019.11.20 Beijing

Contents

CEPC Extremely High Technical Specs

10 GeV

Electron

1) Injector

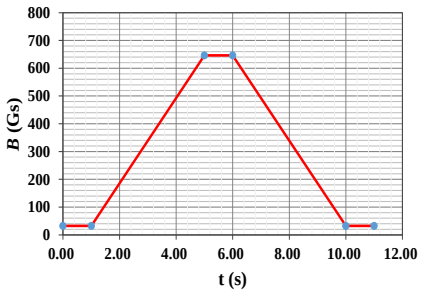
L=1.2km

Positron

2) Booster

C=100km

Energy Ramp
10 ->45/120GeV



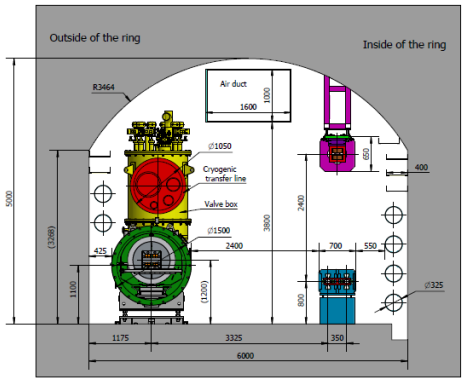
Booster Cycle (0.1 Hz)

Three rings in the sane channel:

- CEPC & booster
- SppC

5) Civil Eng.

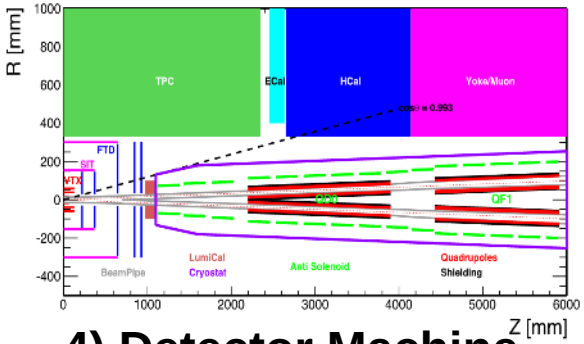
TUNNEL CROSS SECTION OF THE ARC AREA



3) Main Ring

C=100km

45/120 GeV



4) Detector Machine Interface (MDI)

CEPC Industrial Promotion Consortium (CIPC)

Background

In order to complete well this unprecedented CEPC project;

In order to overcome the CEPC Engineering Complexity;

In order to meet the CEPC Extremely High Technical Specs;

What China Industry should do NOW for CEPC?

Through the CEPC project

How to Stimulate the Development of Manufacturing, Technologies, and Engineering Process of China Industry?

CEPC Industrial Promotion Consortium (CIPC)

As the world's most advanced accelerator, CEPC put forward the following directions:

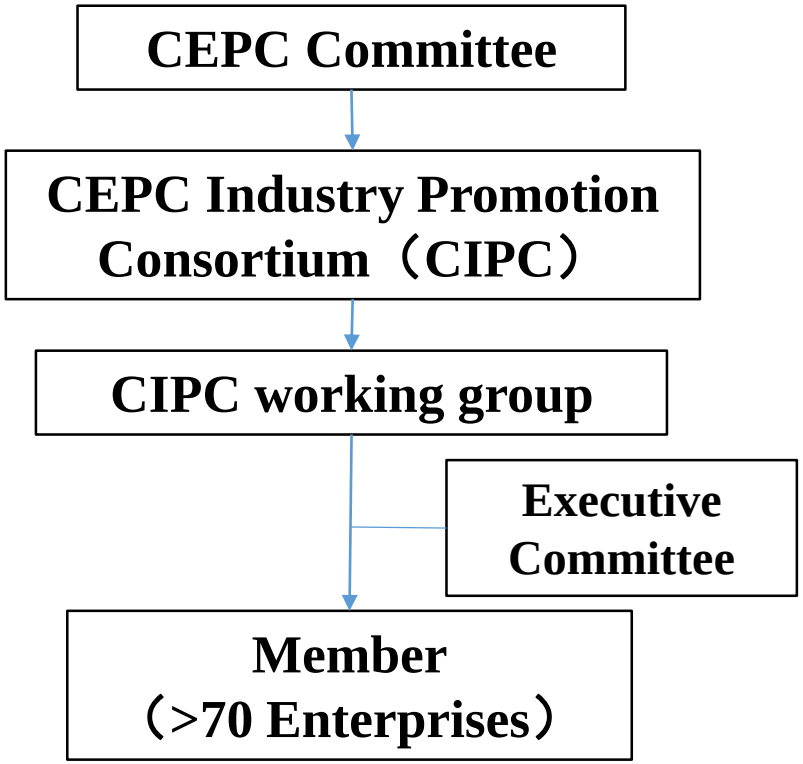
Established in Nov. 7 , 2017

1) Superconduting materials (for cavity and for magnets)
2) Superconductiong cavities
3) Cryomodules
4) Cryogenics
5) Klystrons
6) Magnet technology
7)Vacuum technologies
7) Mechanical technologies
8)Electronics
9) SRF
10) Power sources
11) Civil engineering
12) Precise machinery
.....

More than 40 companies joined in first phase of CIPC，
and 70 companies now.

CIPC Organization

CIPC Working group meetings were held on Nov. 24,2017 and Mar. 14 2018. The Executive Committee was established, and the CIPC charter has been drafted and adopted.



CIPC Logo on the plaque

The representatives of CIPC

序号	姓名	单位	职务	备注
1	高金林 Gao Jinlin	北京中科富海低温科技有限公司 Beijing Sinoscience Fullcryo Technology Co., Ltd.	总经理 GM	主席 Chairman
2	薛华实 Xue Huashi	上海上创超导科技有限公司 Shanghai creative superconductor technology Co., Ltd.	总经理 GM	副主席 vice chairman
3	李　明 Li Ming	中国瑞联集团控股有限公司 China RuiLian Group Ltd.	主席 Director	副主席 vice chairman
4	黄　浩 Huang hao	昆山国力电子科技股份有限公司 Kunshan national power electronic Technologies Inc.	总经理 GM	副主席 vice chairman
5	刘大炜 Liu Dawei	成都飞机工业集团有限责任公司 Chengdu aircraft industry Group Ltd.	厂长/高工 Director	副主席 vice chairman

Five representatives of entrepreneurs form the CIPC working group.

CIPC Partial Member (No order)

LEIKE 雷科电子

KAITENG SIFANG

汉光科技

北广科技 BBEF

上创超导

统力电工 TOLY ELECTRIC

Supconductor Technology 苏州八匹马超导科技有限公司

上海普東科技 PUSU

VACREE

慧宇 HUI YU

昆山国力电子科技股份有限公司 Kunshan GuoLi Electronic Technology Co., Ltd.

Western Superconducting Technologies Co.,Ltd.

中科富海 FULLCRYO

上海辰光医疗科技股份有限公司 Shanghai Chenguang Medical Technologies Co. Ltd

中船重工鹏力（南京）超低温技术有限公司 CSIC PRIDe (NANJING) CRYOGENIC TECHNOLOGY CO.,LTD.

江苏克劳特低温 JiangSu Cryote Co., Ltd.

JJJ vac 三井真空

普达迪泰 PRODETEC

北京航天广通科技有限公司 Beijing Grantel Technology Co., Ltd.

中铁装备 CREG

VACUUM PRODUCTS 瑞隆 Rui Long

SEALTECH

SKY

北京鼎荣达

HUALUN

RA BRARC

HDKY浩德科仪 HoldKY Vacuum Technologies

RuiYuan

天合精机 TIAN HE JING JI

中国铁建

NVT

冰轮环境 MOON-TECH

JST 金盘科技 JINPAN TECHNOLOGY

东方晨景 East Changing

EDWARDS

CBVAC

CIPC Partial Member (No order)

高能锐新 HE-RACING TECHNOLOGY

上海超导 SHANGHAI SUPERCONDUCTOR

爱科赛博 ACTIONPOWER

正机科技 GENTECH

中国电建 POWERCHINA

地矿建设 DIKUANG CONSTRUCTION

核工业井巷建设集团有限公司 HUZHOU CHINA

浙北地质矿产调查研究院 HUZHOU CHINA

黄河勘测规划设计研究院有限公司 Yellow River Engineering Consulting Co., Ltd.

华东勘测设计研究院 HUADONG ENGINEERING CORPORATION

中国电建集团昆明勘测设计研究院有限公司 KUNMING ENGINEERING CORPORATION LIMITED

海南展创光电技术有限公司 HZC PHOTONICS

CIPC Progress

- **On July 26, 2018,** led by the IHEP,CAS, nearly 100 guests from more than 40 member enterprises of CIPC gathered at Beijing to hold a grand "**Sharing Opportunities, and Win-Win Cooperation 2018 CIPC Annual Meeting**" to **discuss the future development strategy of Chinese industry about CEPC. The annual meeting elects the CIPC Bureau and executive committee**.
- **On Oct. 22-26, 2018,** CIPC presetnted a **report-China Industry for CEPC** at LCWS2018 in Arlington, Texas,USA.
- **On Nov. 12-14, 2018**, attended the CEPC International Conference, and held the CIPC parallel sessions and plenary meeting. On November 14th, the (CEPC) research group officially released the CEPC Conceptual Design Report (CDR), which are the "Conceptual Design Report -- accelerator Volume" and "Conceptual Design Report -- Detector and Physics Volume". The workshop also intends to develop initial plans towards Technical Design Reports (TDR).

Cryogenics workshop on TDR of CEPC

Nov 27, 2018, IHEP, Beijing, China

- Nearly 20 participants from the backbones of Fullcryo, Hefei Juneng new energy, Jiangsu Cryote, CSIC Pengli, Anhui Wacree, Wuxi innovation and other companies, with the scientific researchers from the IHEP and the Institute of physics and chemistry, CAS.
- The meeting focused on the major requirements of cryogenic system on the technical design report (TDR) of CEPC project, and comprehensively discussed the work tasks and challenges.
- Dr. Li Shaopeng, who is in charge of cryogenic system on CEPC, introduced the work content and schedule on the concept design report (CDR) of CEPC.
- All participants would actively participate in relevant work by means of technical or financial investment, and carry out key equipment such as large-scale refrigerator, cryogenic thermostat and valve box, high-performance low-temperature transmission pipeline and helium recovery and purification equipment.
- The establishment of Cryogenics workshop on TDR of CEPC marks the beginning of China's industry cooperation on Cryogenic system .
- On this cooperation seminar, it has gathered the advantages of various field's company, and benefit to accelerate the rapid development of the technology industry.

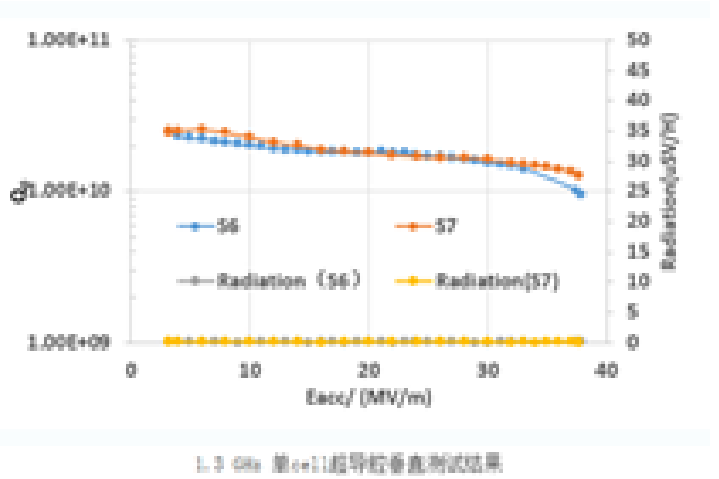
CIPC working group meeting On June 4,2019

- On June 4, CEPC Industry Promotion Association (CIPC) held the working meeting of the presidium in 2019. Five member participated in the meeting, with Dr. Gao Jie, vice chairman of CEPC organization committee.
- After the meeting, Dr. Wang Yifang, the head of IHEP, had in-depth exchanges with members of CIPC presidium.
- The meeting focused on the work plan of CIPC in 2019, and new members' participation in the meeting. And also discussed how CIPC can expand publicity, strengthen collaboration with its industry and relevant departments, and how CIPC can participate in and play a greater role in TDR of CEPC.
- In the future, we hoped that CIPC would further expand its organizational scale and coverage areas, and contribute more to the research of key technologies of CEPC, industrial preparation, enterprise cultivation, technology transfer and application in other fields.

New progress on high performance 1.3 GHz Superconducting Cavity

June, 2019, IHEP, Beijing, China

- Two 1.3 GHz single cell superconducting cavities (PAPS-HTF-1300-S006 and PAPS-HNF-1300-S007) were developed. In 2K vertical test, when the acceleration gradient Eacc reached 37MV/m, the Q_0 =1 × 10^{10}; when Eacc reached 16MV/m, the Q_0 =1.9 × 10^{10} .
- This is the highest acceleration gradient on domestic processing and electropolishing, the quality control and clean assembly technology up to the international advanced level.
- The 1.3 GHz Superconducting Cavity is the main type of Shanghai hard X-ray free electron laser device and the future Ring Electron Positron Collider. The acceleration gradient of the cavity has laid the foundation for the future practical engineering cavity.



1.3 GHz 单cell超导腔垂直测试结果

(contributed by RF superconducting and Cryogenics Research Center, Accelerator Center and Beijing Ruixin Technology Co., Ltd.)

Domestic 2998Mhz klystron passed high power test On June 21, 2019

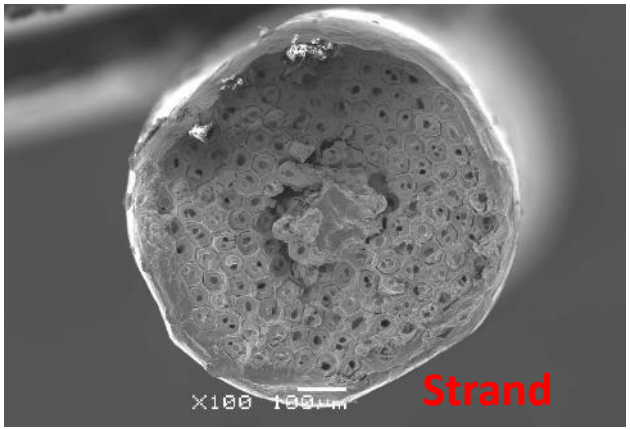
- On June 21, 2019, 2998Mhz klystron developed by IHEP, CAS and Hubei Hanguang Technology Co., Ltd. passed the field test, and its performance reached the level of similar products in the world. Under pulse width of 4 μs, repetition frequency of 50Hz, pulse high voltage of 319.3kV and pulse current of 358A, the output pulse power of klystron reaches 50.4MW, gain of 50dB and efficiency of 44%.
- This is the first time that the frequency klystron has been successfully developed in China, which can meet the use requirements of large scientific devices such as high-energy synchrotron radiation light source. It has a positive and important role in promoting the China's microwave power source system.

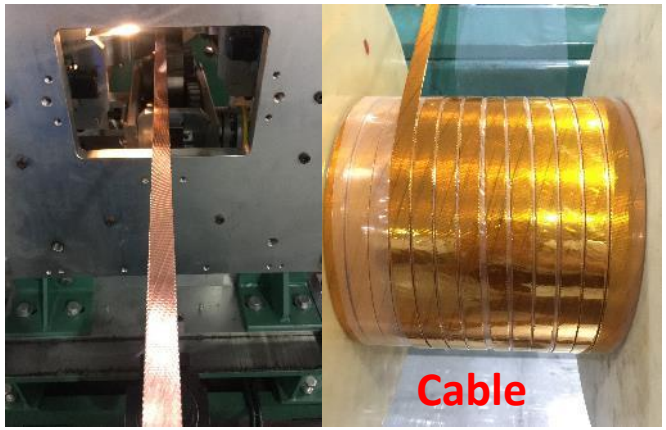
CEPC Civil engineering enters into technical design report(TDR) June 3, 2019

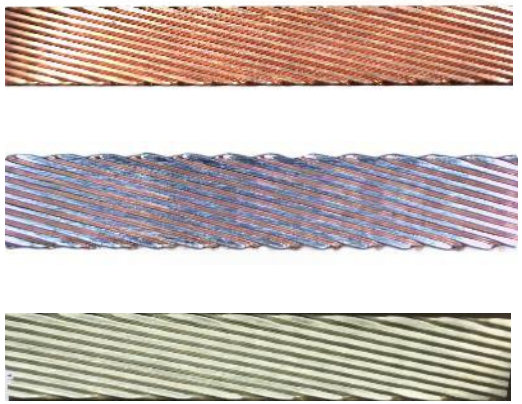
- On June 3, 2019, the civil engineering design Seminar meeting of CEPC was held in IHEP, CAS.
- Relevant engineering and technical personnel of Yellow River exploration planning and Design Co., Ltd., East China exploration and Design Institute Co., Ltd., Central South exploration and Design Institute Co., Ltd., Zhongke high energy Technology Co., Ltd., School of technology of overseas Chinese University (Quanzhou), etc. attended the meeting.
- This meeting mainly discusses the optimized layout of CEPC civil engineering tunnel group, the requirements and standards of civil engineering design specifications, the requirements of stage development scale of general facilities, the real model tunnel layout design and the optimized design of CEPC components in production, measurement, transportation, storage, and installation.
- This meeting laid a foundation for further development of CEPC civil engineering design in the next stage.

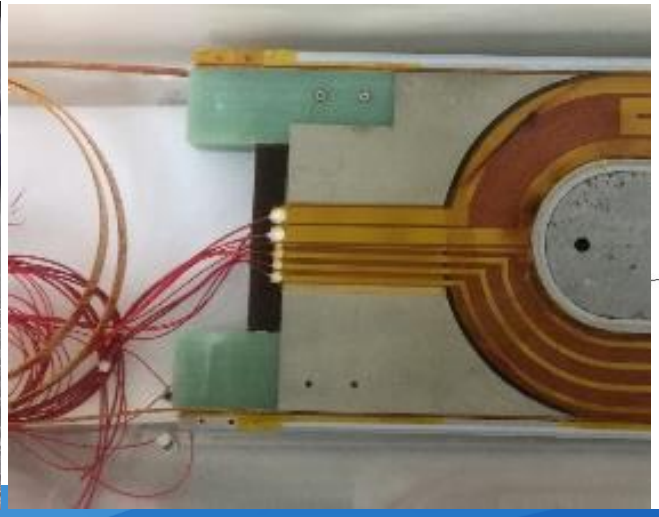
Collaborators

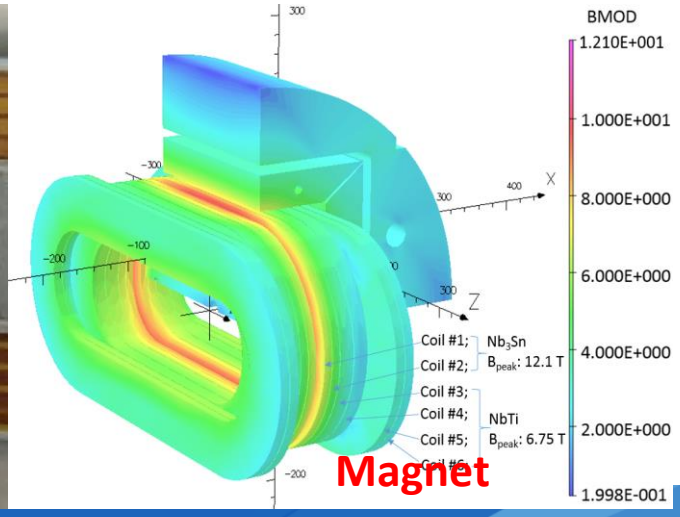
WST： NbTi strands ➡ Toly Electric： Rutherford cables ➡ IHEP-CAS： Magnets





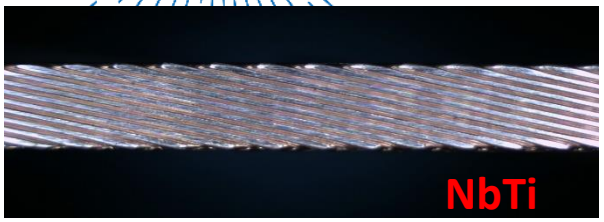


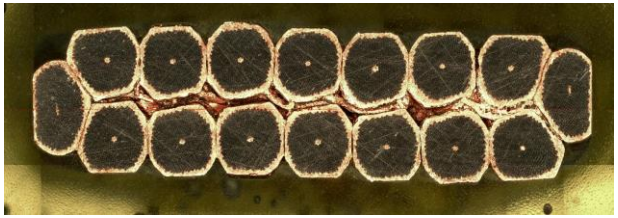


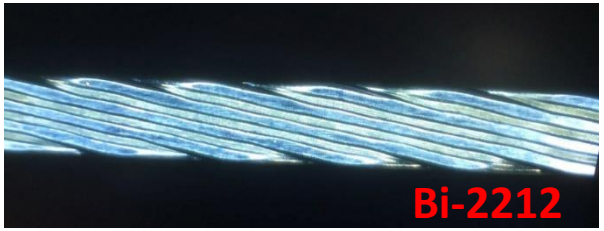


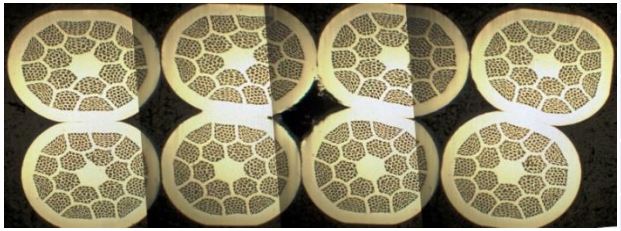
Rutherford cable

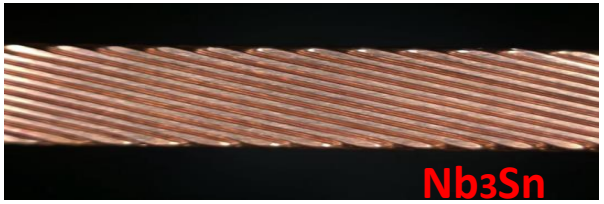
Wuxi Toly Electric Works Co.,Ltd.

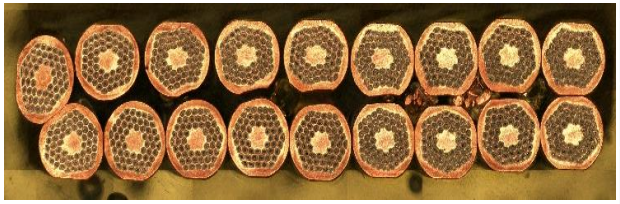


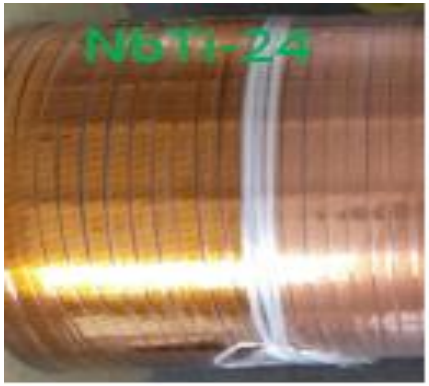


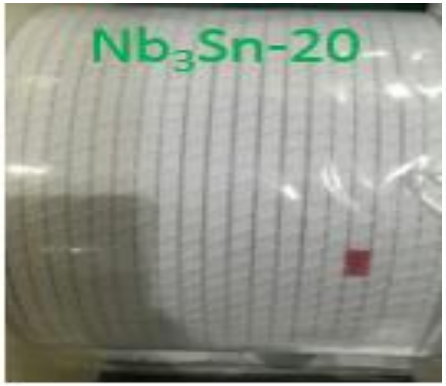












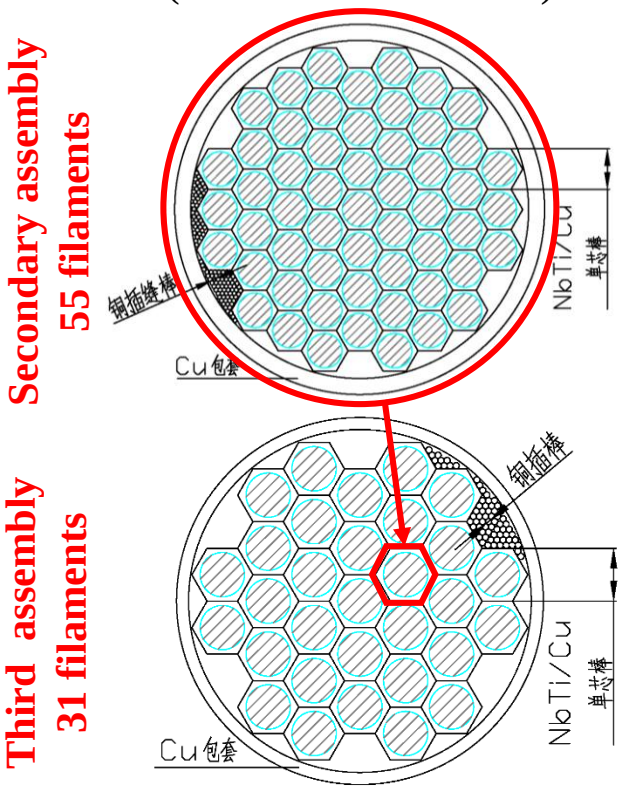
Diam.	Wire number	Twist angle	Pitch	Thickness	Width	Filling factor
0.500	12	11.54	30.0	0.93	3.00	86.2%
0.700	11	9.64	46.0	1.26	3.90	87.4%
0.700	20	16.60	49.0	1.19	7.44	90.7%
0.720	18	14.60	51.5	1.38	6.40	85.7%
0.727	18	22.64	34.0	1.33	6.94	87.7%
0.740	11	10.19	46.0	1.28	4.04	93.0%
0.800	20	16.91	55.0	1.41	8.44	88.0%
0.818	18	19.10	45.0	1.45	7.61	90.7%
0.818	36	18.46	93.0	1.50	15.38	86.5%
0.820	40	15.34	124.0	1.52	16.96	85.0%
0.825	24	16.91	68.0	1.50	10.16	88.0%
0.825	38	16.87	108.0	1.50	16.65	85.0%
1.000	30	14.00	124.0	1.78	15.80	86.3%
1.200	48	18.66	180.0	2.13	30.50	88.2%
1.500	32	15.20	183.0	2.76	24.80	85.6%

•At present，the longest Rutherford cable reaches 1500 meters.

Experiment scheme

Technical Requirements		
Bare Wire Dimensions /mm	0.50±0.01	/
Cu:Sc Ratio	1.30±0.13	/
Filament diameter /μm	＜8μm	Number of Filaments＞1700
Surface Condition (Before Insulation)	Sn5Ag/Ni (1~2μm)	Electroplate
Ic (A) *2, 4.2K, 0.1μV.cm $^{-1}$	3T：≥340A 4T：≥280A 5T：≥230A	The Ic requirement is higher.
Single Wire length	＞2200m	/

Three times assembly scheme
(55*31=1705 filaments)

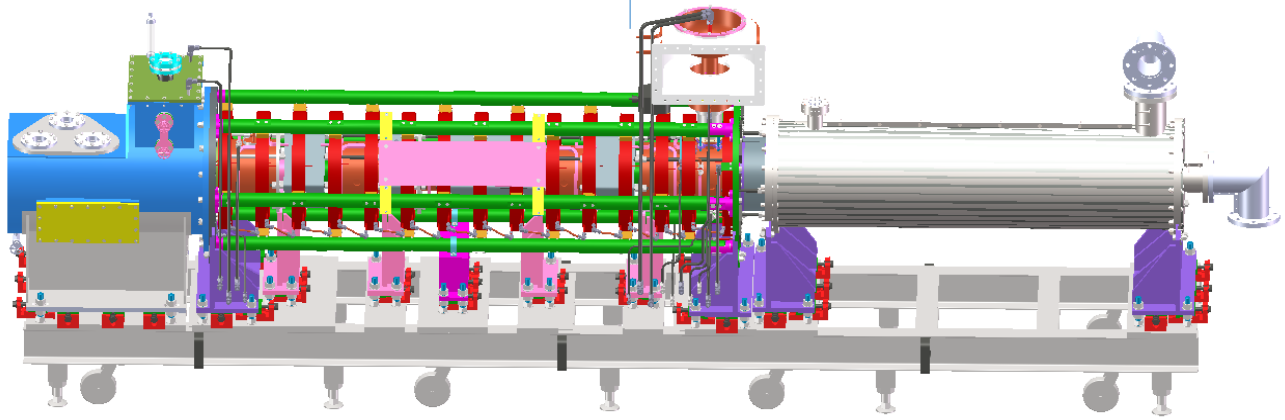


Combined with technical requirements of Institute of High Energy Physics, WST designed the three times assembly method to meet performance requirements (55*31=1705 filaments).

650MHz/800kW klystron for CEPC

Cooperation of IHEP, IECAS and GLVAC

Design



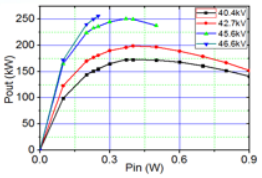
- E-gun
- Cavities

- Collector
- Coils
- Oil cylinder
- Operation support

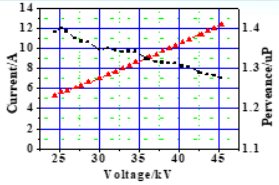
Progress on CEPC 650MHz/800kW Klystron

Institute of Electronics of CAS,2019

Development of CW Klystrons in IECAS



Output Power .VS. Input Power



Current and Conductivity .VS. Voltage

C-Band CW 250kW Klystron

for Tokamak project

Parameter	Data	Units
Frequency	4600	MHz
Output Power	250	kW
Efficiency	45	%
Gain	50	dB

Developed for EAST TOKAMAK

www.aircas.ac.cn

Development of Pulse Klystrons in IECAS

C-band 50MW klystron

C-Band 50MW Klystron

Parameter	Data	Units
Frequency	5712	MHz
Peak Output Power	50	MW
Efficiency	45	%
Gain	50	dB
Pulse Width	2.5	μs
Pulse Repetition Rate	50	Hz

www.aircas.ac.cn

Progress on CEPC 650MHz/800kW Klystron

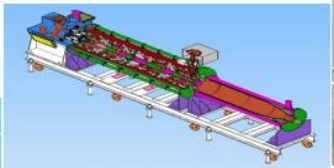
Project planning

2017.11-2019.10

Research Works

- Simulation
- Verification
- Optimizing
- Cold test
- Assembly
- Degassing

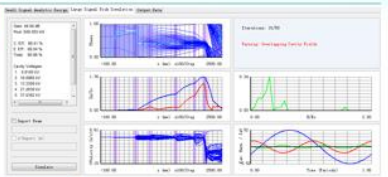
Parameter	Data	Units
Frequency	650	MHz
Output Power	800	kW
Efficiency	60	%
Gain	45	dB



Progress on CEPC 650MHz/800kW Klystron

Simulation Review

- High-frequency parameters of the cavity
- Beam wave interaction



Parameters of resonator cavity

Parameters	Input cavity	2th cavity	3th cavity second harmonic	4th cavity	5th cavity	Output cavity
Frequency (MHz)	650.5	649.5	1293.5	669.2	668	649.5
CST Tetra/Hexa	648.7758 648.5805	649.1828 648.5081	1294.009 1293.362	668.8461 666.3338	667.5982 666.2509	642.354 635.6065
R/Q	151.9	150.5	75.2	117.5	110.2	93.3
CST Tetra/Hexa	150.2 151.73	150.03 150.16	75.04 75.06	117.18 116.2	110.01 109.3	100.95 100.40
Q_0	16942	17223	11052	15507	17598	15670
CST Tetra/Hexa	16280 14711	17408 17078	11098 11036	15668 15275	17749 17497	14737 15138
Q_e	292					67

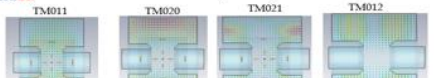
Higher Order Modes of resonator cavity

Parameters	Input cavity	2th cavity	3th cavity second harmonic	4th cavity	5th cavity	Output cavity
TM_{010}(MHz)	1023/991.6 7	948.6/948 .35	2811.4/2890. 9	1143/1142.7	1407.2/140 6.7	1650/1501
TM_{020}(MHz)	1902/1943. 32	1838.6/201 2	--	2886.7/257 3	2123.3/212 1.7	
TM_{021}(MHz)	--	2296.9/23 88	--	2574.3/27 60	2457.9/24 56.4	

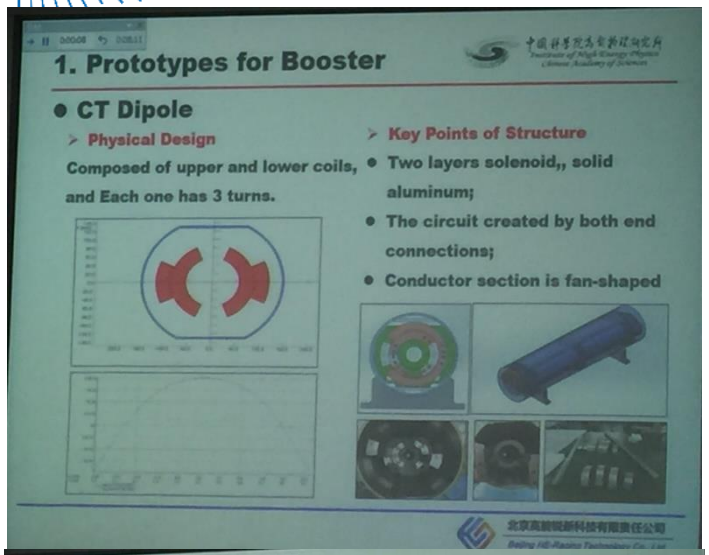
parameters	Design value
Frequency(MHz)	650
Voltage(kV)	81.5
Current(A)	15.1
Perveance(μP)	0.65
Input power (W)	10.5
Efficiency(%)	≥60/70
Saturated gain(dB)	≥45/49.5
Output gain(kW)	800/865.9
Cavity number	6

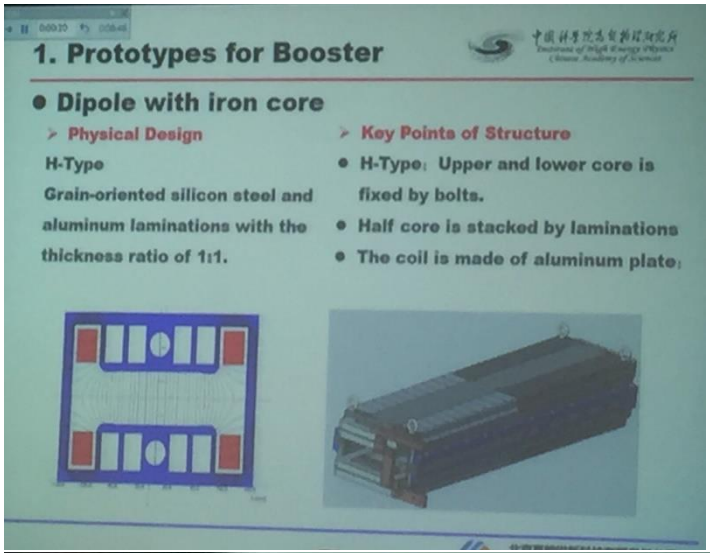
Pout 865.9kW@Pin10.5W

Bandwidth(≥45dB)：≥5MHz



5 prototypes dipole for Booster & 2 prototypes cell for SCC, Beijing HE-Racing Tec. Co.Ltd.

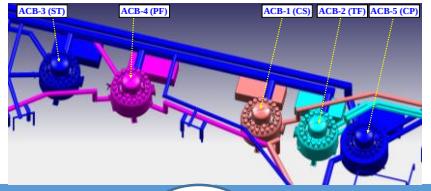




Cryogenics Collaboration

中科富海 FULLCRYO

Milestone of Domestic Cryogenic activities



1959 Initial helium liquefaction

1976 Helium cryogenic system of KM-4

2008 Distribution valve boxes for "ITER" large-scale cryogenic system ; PKU-FEL 2K cryogenic system

2012 2kW@20K helium refrigerator

2013 Participated in "SSRF" cryogenic system construction

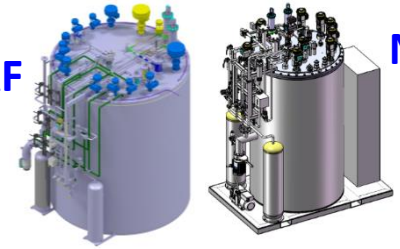
2015 40L/h helium liquefier

2017 250W@4.5K helium refrigerator

20 Participated in "BEPC II" cryogenic system construction

2018 1000L/h H2 liquefier
200W@4.5K helium refrigerator for NFRI

NFRI



HIAF

2019 2500W@4.5K & 500W@2K helium refrigerator
500W@4.5K helium refrigerator

2020 ADS

2023 18000W@4.5K helium refrigerator

CEPC

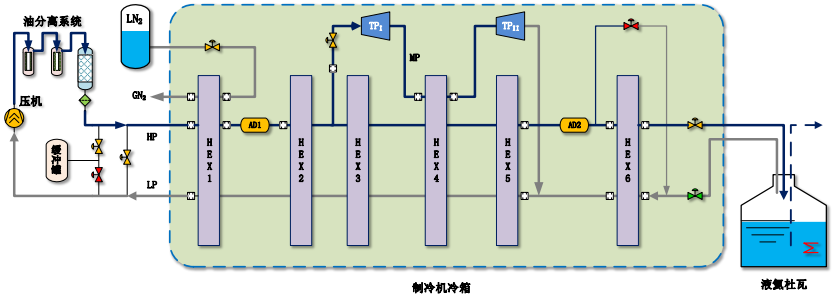
TDR Design Seminar
11/27/2018

1000W@4.5K helium refrigerator ;
10000W@4.5K helium refrigerator design

Fullcryo Helium refrigerator

氦液化器系列	FHL-40	FHL-70	FHL-100	FHL-140	FHL-180	FHL-240	FHL-280
液化率 L/h	40~70	70~100	100~140	140~180	180~240	240~280	280~310
压缩机额定功率 kW	75~90	90~132	132~160	160~200	200~250	250~315	315~355

氦制冷机系列	FHR-40	FHR-70	FHR-100	FHR-140	FHR-180	FHR-240	FHR-280
制冷量 W	160 ~250	250~320	320~450	450 ~580	580~750	750 ~900	900 ~1000
压缩机额定功率 kW	75~90	90~~132	132~160	160~200	200~250	250~315	315~355

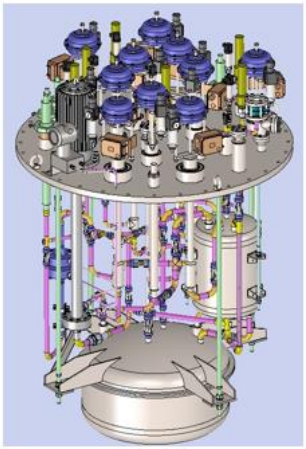


Cryogenics Collaboration

EASYCOOL 易酷®

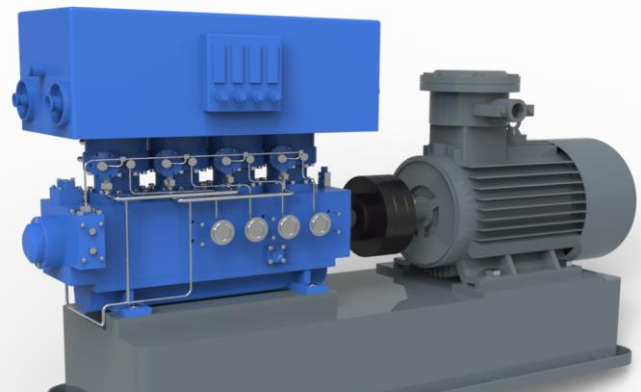
大科学装置用低温系统

2K、4K、20K、80K 低温冷箱



2K冷箱-负压换热器测试系统

中船重工鹏力 集团

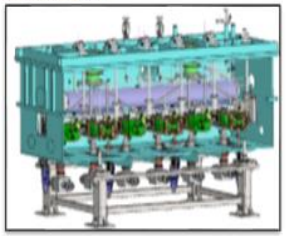


江苏克劳特低温—大冷量斯特林低温制冷机产品
制冷量：4500 W @ 77 K

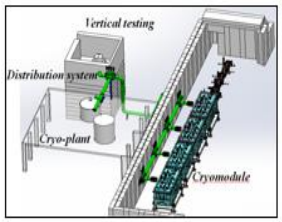
VACREE

Cryogenic Infrastructure for Superconducting Accelerator

Since 2014, VACREE have offered 6 Cryomodules to IMP



CM6 Cryomodule for Institute of Modern Physics (IMP)



Manufacturing,Installation&Commissioning

低温恒温器

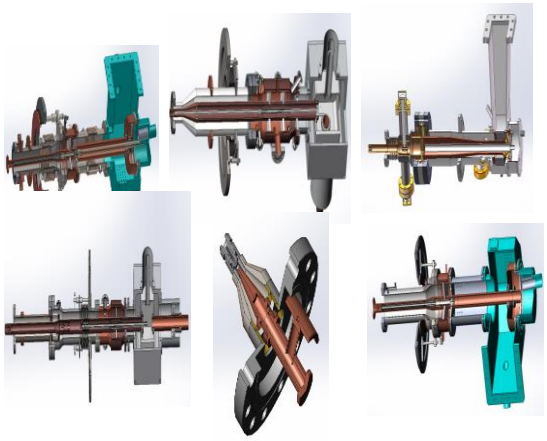
2010年起开始生产EXFEL项目的58台低温恒温器的订单。两年内完成了所有的订单任务并发运。

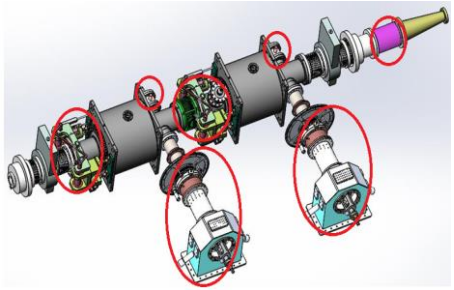
Industrial Promotion Consortium (CIPC)

650MHz Couple for CEPC-SCRF

Institute of HuaDong Guangdian

2015年**接触耦合器产品**，先后完成了中科院近物所162.5MHz双热窗耦合器、冷热双窗耦合器，北京大学1.3GHz耦合器，高能所650MHz耦合器、650MHz高次模耦合器，上海应物所1.3GHz高功率输入耦合器以及一些耦合器部件的工艺研究和制造工作。





序号	频率	功率	工作状态	用户	数量	备注
1	162.5MHz	20KW	CW	近物所	29	冷热双窗
2	162.5MHz	20KW	CW	近物所	20	双热窗
3	650MHz	150KW	CW	高能所	2+2	可调+固定
4	650MHz	1KW	CW	高能所	4	高次模耦合器
5	1.3GHz	14KW	CW	应物所	4	
6	1.3GHz	10KW	CW	北大	2	

安徽华东光电技术研究所有限公司

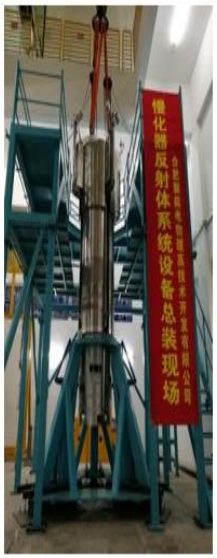
Key Instruments & Vacuum system

Hefei Juneng

主要发展方向及业绩

■ 国家大科学工程关键仪器设备

参与中国散裂中子源建设，高质量完成质子束窗、反射体插入件、主/次准直器、主剥离膜、散射腔、废束窗、壁电流探头、聚束腔、散束腔、冲击磁铁、靶体插件、交流二极磁铁线圈等近百余台套设备的研制。



主要发展方向及业绩

■真空和低温系统

为北京正负电子对撞机、EAST装置、40T混合磁体、ITER馈线、ADS先导项目、北方先进光源测试平台、美国GA磁体测试平台、超导质子加速器等成功研发、制造各种大型低温阀箱及传输系统。

BEPCⅡ国内首台超导腔低温恒温器

近几年完成多台低温恒温器及阀箱

Key Instruments for SC coil

Hefei KeYe

磁体超导线圈及线圈生产线设备

□ CFETR 中心螺线管超导模型线圈制造

➢ CS模型线圈的研制，是我国首次研制成功的大尺寸超导中心螺线管线圈，为后续CFETR的建造提供了宝贵的经验。

◆CSMC NbTi线圈

- 外形尺寸：Φ2457.4* Φ 3547.4*545mm
- 最终线圈绕制精度：±2mm

◆CSMC Nb_3Sn线圈

- 外形尺寸： Φ 1951* Φ 2359* 1648.6
- 最终线圈绕制精度：±2mm

合肥科烨电物理设备制造有限公司

◆CFETR CS模型线圈绕制生产线

CFETR CSMC绕制生产线也是一套完整的超导磁体绕制生产线，包含多个子系统，主要有，超导导体放送系统，超导导体校直系统、喷砂系统，支撑系统、绕制成型机系统，回转平台、绕制模具、伺服控制系统系统，整个生产线均由我公司设计制造 。

合肥科烨电物理设备制造有限公司

CEPC Accelerator related Domestic Collaboration

On CEPC accelerator many systems, we also have carried out in-depth collaborative design and pre research work with enterprises.

- CEPC 650MHz high efficiency klystron (Kunshan national power,IECAS, HE-Racing,etc.);
- MDI Design/Assembly machinery (Shenyang Hui Yu,Chinese Aerospace Academy, etc.);
- SCRF (Anhui Huadong,Shanghai Sanjing vaccum, Beijing Fu Bin Sheng Shi Vacuum,etc.)
- Superconducting magnet (Wuxi Tongli, Shanghai Pushu, Hefei juneng,etc.).
- Cryogenics (Fullcryo, Vacree, Pengli, Wuxi, Hefei juneng,etc.)
- Vaccum(Shanghai Vacuum ,Chuanbei Vaccum, Shenyang Hui Yu,Hefei Keye)
- CEPC site selection, civil engineering and Science Town Planning (Yellow River Conservancy Commission, HUADONG ENGINEERING CORPORATION LIMITED, JiLin University, etc.).
- Etc.

CIPC at this Workshop:
35 reports and about 80 attendee

Monday 18 November 2019

14:00 - 16:05 CIPC

Convener: 浩 黄

Location: C305

14:00 **Klystron** *15'*
Speaker: 永明 李 (昆山国力大功率器件工业技术研究院)

14:15 **Klystron** *15'*
Speaker: 瑞 张 (电子所)

14:30 **Klystron** *15'*
Speaker: 修东 杨 (中科院空天信息研究院)

14:45 **Collider, booster and linac magnets** *15'*
Speaker: 旭文 戴 (所工厂)

15:00 **Collider magnets** *15'*
Speaker: 明涛 康 (上海普束科技有限公司)

15:15 **Linac magnet** *15'*
Speaker: 光亮 朱 (合肥科烨电物理设备制造有限公司)

15:30 **Electro-magnet seperator** *15'*
Speaker: 盘林 郭 (上海夯业真空设备科技有限公司)

15:45 **Electro-magnet seperator** *15'*
Speaker: 守平 王 (中信重工机械股份有限公司)

16:30 - 18:30 CIPC

Convener: 大炜 刘

Location: C305

16:30 **Linac structure and SCRF cavity fabrication** *15'*
Speaker: 旭文 戴 (北京高能锐新公司厂长戴旭文)

16:45 **NbTi超导卢瑟福电缆** *15'*
Speaker: 裕 赵 (无锡统力电工股份有限公司)

17:00 **0.5mm NbTi超导股线** *15'*
Speaker: 燕敏 朱 (西部超导材料科技股份有限公司)

17:15 **超导四极磁体QD0短样机制造** *15'*
Speaker: 海京 王 (合肥聚能电物理高技术开发有限公司)

17:30 **超导四极线圈加热固化系统** *15'*
Speaker: 艺 万 (合肥科烨电物理设备制造有限公司)

17:45 **CEPC MDI-1** *15'*
Speaker: 吕洪清 (无锡创新低温环模设备科技有限公司)

18:00 **CEPC MDI-2** *15'*
Speaker: 志华 刘 (沈阳慧宇真空技术有限公司)

18:15 **CEPC MDI-3** *15'*
Speaker: 绍栋 何 (北京空间机电研究所)

Tuesday 19 November 2019

08:30 - 10:10 CIPC

Convener: 明 李

Location: C305

08:30 **Vacuum** *15'*
Speaker: 东林 章 (上海真空阀门制造有限公司)

08:45 **Vacuum** *15'*
Speaker: 宇 蔺 (川北真空科技（北京）有限公司)

09:00 **Vacuum** *15'*
Speaker: 崇凌 赵 (中国科学院沈阳科学仪器股份有限公司)

09:15 **Vacuum** *15'*
Speaker: 奇 杨 (沈阳慧宇真空技术有限公司)

09:30 **Vacuum** *15'*
Speaker: 涛 陶 (合肥科烨电物理设备制造有限公司)

09:45 **SCRF** *15'*
Speaker: 领会 杜 (宁夏东方超导科技有限公司)

10:30 - 12:30 CIPC

Convener: 金林 高

Location: C305

10:30 **SCRF** *15'*
Speaker: 海根 邵 (安徽华东光电技术研究所有限公司)

10:45 **SCRF** *15'*
Speaker: 承业 郑 (上海三井真空设备有限公司)

11:00 **SCRF** *15'*
Speaker: 文清 李 (北京富斌盛世真空设备有限公司)

11:15 **cryogenics** *15'*
Speaker: 金林 高 (北京中科富海低温科技有限公司)

11:30 **Cryogenics** *15'*
Speaker: 学华 章 (安徽万瑞冷电科技有限公司)

11:45 **cryogenics** *15'*
Speaker: 森 蔡 (中船重工鹏力（南京）超低温技术有限公司)

12:00 **cryogenics** *15'*
Speaker: 洪清 吕 (无锡市创新低温环模设备科技有限公司)

12:15 **Cryogenics** *15'*
Speaker: 杰峰 吴 (合肥聚能电物理高技术开发有限公司)

Tuesday 19 November 2019

14:00 - 16:10 CIPC

Convener: 大明 孙

Location: C305

14:00 **cryogenics** *15'*
Speaker: 大明 孙 (江苏克劳特低温技术有限公司)

14:15 **Instrumentation** *15'*
Speaker: 海根 邵 (华东光电研究院)

14:30 **Instrumentation** *15'*
Speaker: 子燕 谢 (浩德科仪真空技术有限公司)

14:45 **Instrumentation** *15'*
Speaker: 崇凌 赵 (沈阳科学仪器厂)

15:00 **radiation protection** *15'*
Speaker: 龙 张 (北京市射线应用研究中心)

15:15 **radiation protection** *15'*
Speaker: 泽学 郭 (天津市万木辐射防护工程有限公司)

15:30 **MDI远程真空连接设计** *15'*
Speaker: 志华 刘 (沈阳慧宇)

15:45 **超导铁支架设计** *15'*
Speaker: 宝瑞 刘 (航天508所)

16:30 - 19:00 CIPC

Convener: 豫 肖

Location: C305

16:30 **隧道磁铁、支架等设备运输车辆** *15'*
Speaker: 超 孙 (北车618所)

16:45 **100m参观模型设计，1:1mockup隧道设计** *15'*
Speaker: 育宏 郑 (中科高能科技有限公司)

17:00 **非接触式精密测量和智能视觉系统** *15'*
Speaker: 生宏 范 (北京普达迪泰科技有限公司)

17:15 **精密基准件研制** *15'*
Speaker: 长河 朱 (汉中远航精密机械制造有限公司)

17:30 **高分辨率对地观测系统、机械设计、系统集成** *15'*
Speaker: 兴泽 王 (中国空间技术研究院总体部)

17:45 **精密光电测量系统** *15'*
Speaker: 达宝 劳 (中国科学院微电子所)

18:00 **大地测量，工程测量** *15'*
Speaker: 进贵 邹 (武汉大学 测绘学院)

18:15 **CEPC地质研究** *15'*
Speaker: 保芝 潘 (吉林大学地质系)

Wednesday, November 20, 2019

08:30 - 10:10 CIPC

Convener: 继东 孙

Location: C305

08:30 **Installation and store** *15'*
Speaker: 佳斌 王 (华侨大学)

08:45 **SppC magnet** *15'*
Speaker: 建伟 刘 (西部超导)

09:00 **SppC magnet** *15'*
Speaker: 跃 赵 (上海超导)

09:15 **SppC magnet** *15'*
Speaker: 传兵 蔡 (上海大学/上创超导)

09:30 **SppC magnet** *15'*
Speaker: 裕 赵 (统力电工)

09:45 **CIPC全体会议** *15'*

11:30 **CIPC report** *20'*
Speaker: Dr. Jinlin Gao (Fullcryo Technology Co.,Ltd)

Summary

- 35 companies have presented the reports in this Workshop in reviewing the work that were done in CDR/TDR stage and current progress/future plan. It needs more and more participation and support from enterprises.

- Up to now, more than 70 enterprises have participated in CIPC in 2019. In the future, it will further expand the scale and coverage of CIPC member units, and strengthen the pre research cooperation between research and design teams and enterprises.

- In the TDR stage of CEPC, work together with the accelerator and detector team to complete the TDR task target of CEPC as planned in 2022, and prepare for the industrialization of CEPC engineering construction from 2022 to 2030.

Summary

- The demand for basic scientific research lead to the improvement of industrial level;
- The improvement of industrial level has greatly promoted basic scientific research.
- As director Wang Yifang said, the cooperation between basic scientific research and industry has improved the innovation R & D ability of industry;Trained innovative R & D talents; Also the enterprise has got the opportunity to enter the relevant international market.
- Finally, the China's industry power will be improved.

Thank you for your kind attention

Contact information:
CEPC Committee: Jie Gao, IHEP, China
CIPC Working group: Jinlin Gao, Beijing Sinoscience FULLCRYO Technology Co., LTD
CIPC Executive Committee:
Qinyan Pan, Beijing Sinoscience FULLCRYO Technology Co., LTD
E-mail: qypan@fuhaicryo.com
Tel: +86 10 86468866