



ITU Green standards week Innovating today for a sustainable tomorrow_

Review of the Developing Technologies of Cabled Ocean Observatory in China

Prof. Canjun Yang

Zhejiang University The State Key Lab of Fluid Power Transmission and Control Sep. 19, 2013





Lab Prototype in Zhejiang University

Testing Prototype and Sea Trials

The Pilot Regional System in South China Sea

The Pilot Coastal System-Z₂ERO

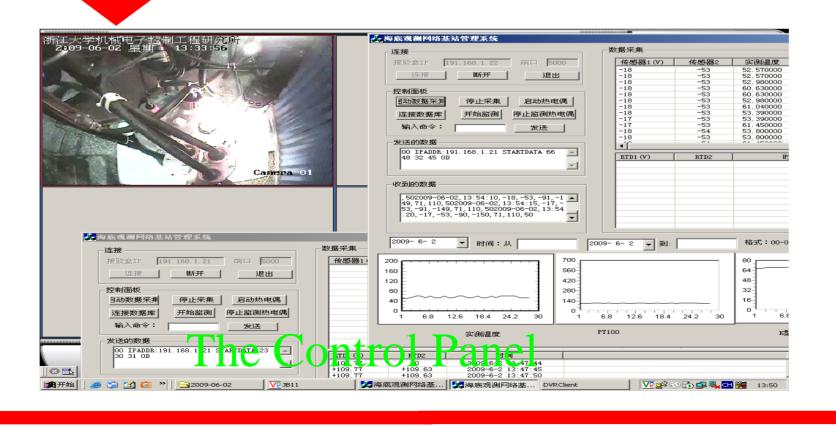
Other Projects in China



Lab Prototype in Zhejiang University

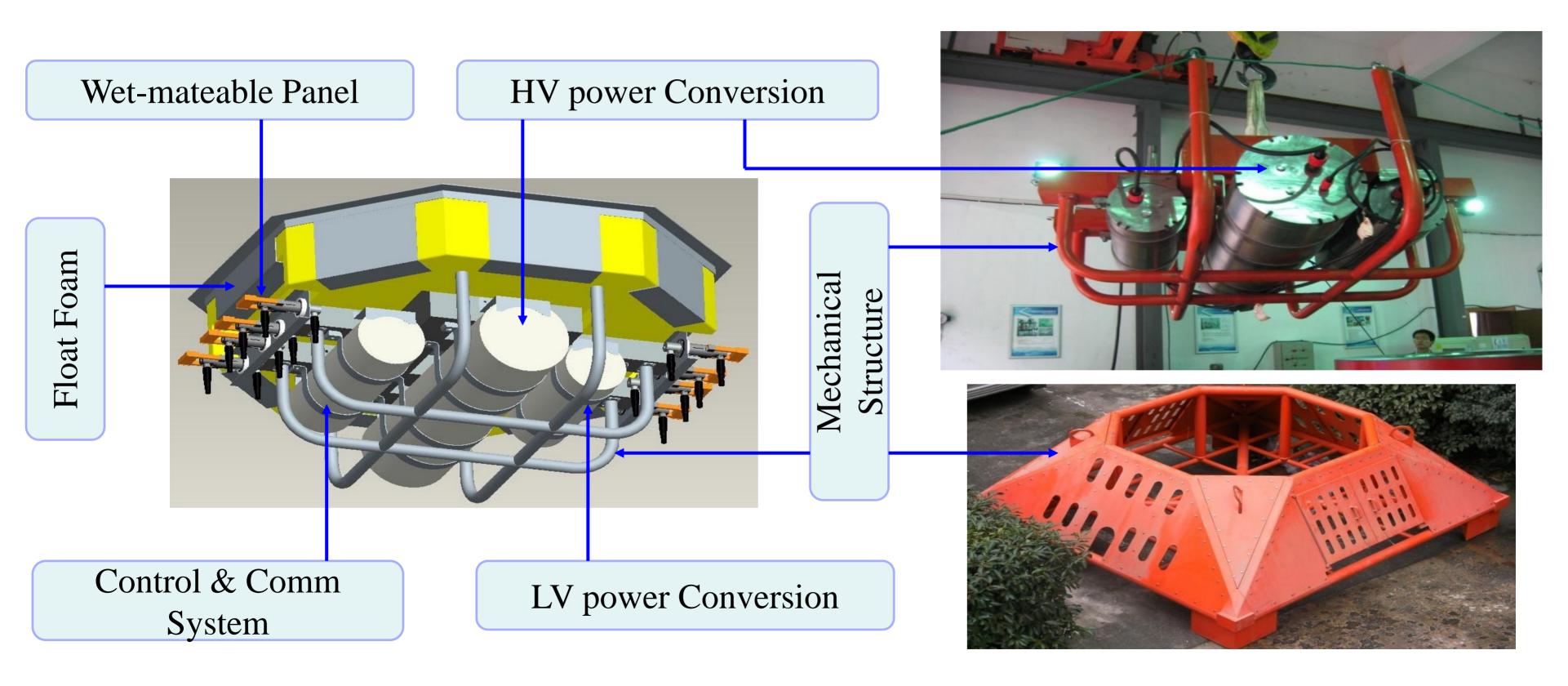






Secondary Node in Pressure Chamber

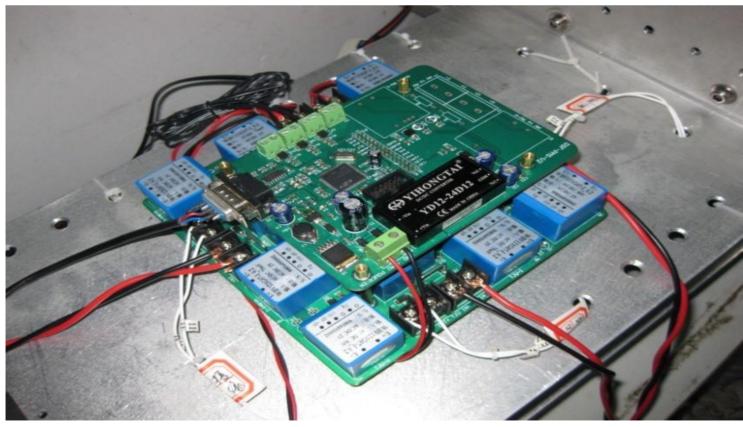
Mechanical Design of the Junction Box

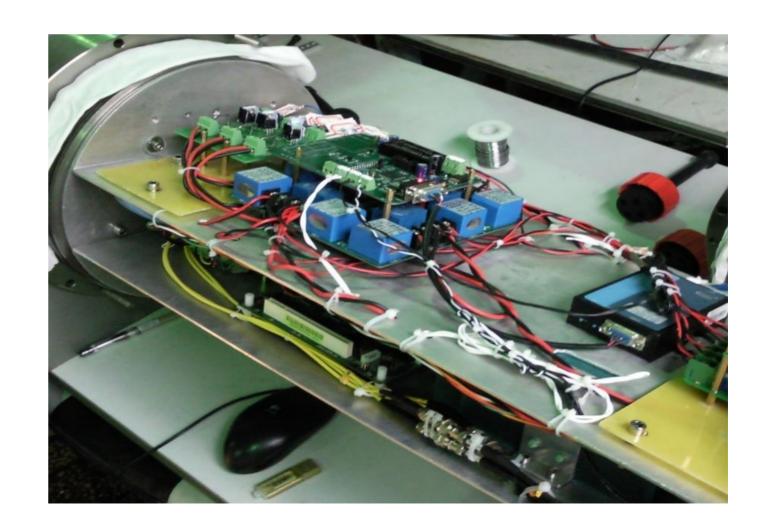


Control & Communication System







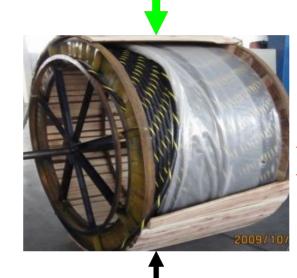




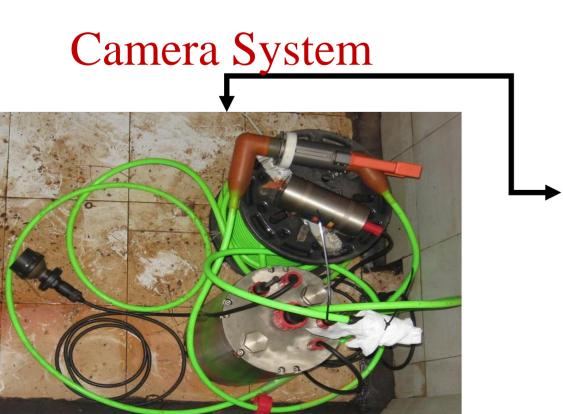
10kV Powered Observatory-Lab Test

10kVDC Power Supply





Lab Test (July 2010) Location: Zhejiang Univ.







Control Server

1km O/E Submarine Cable

Chemical System Physical System



Sep. 2010 Shengshan Island

Volt: 10 kV Depth: 31 m Length: 1 km Duration: 5 d



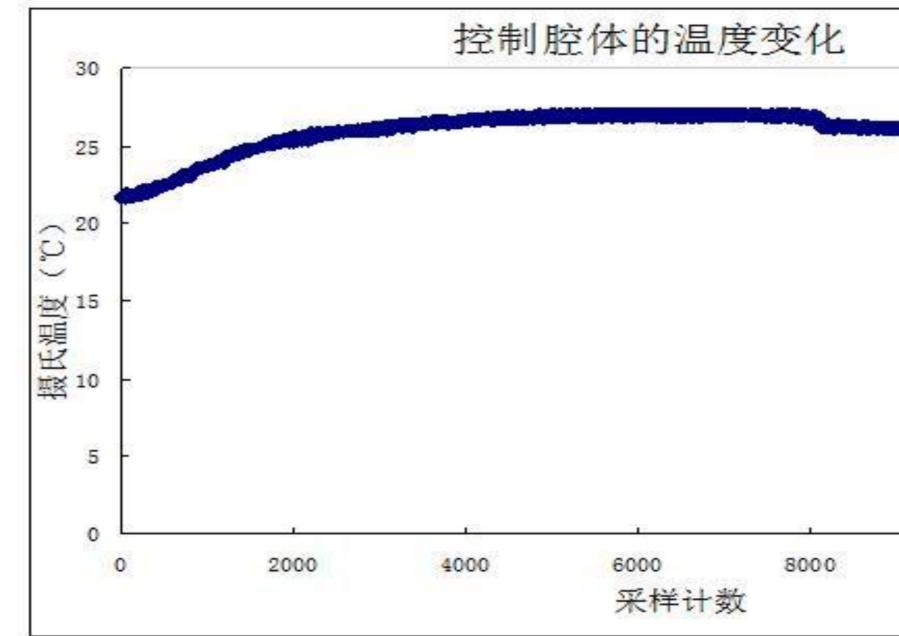






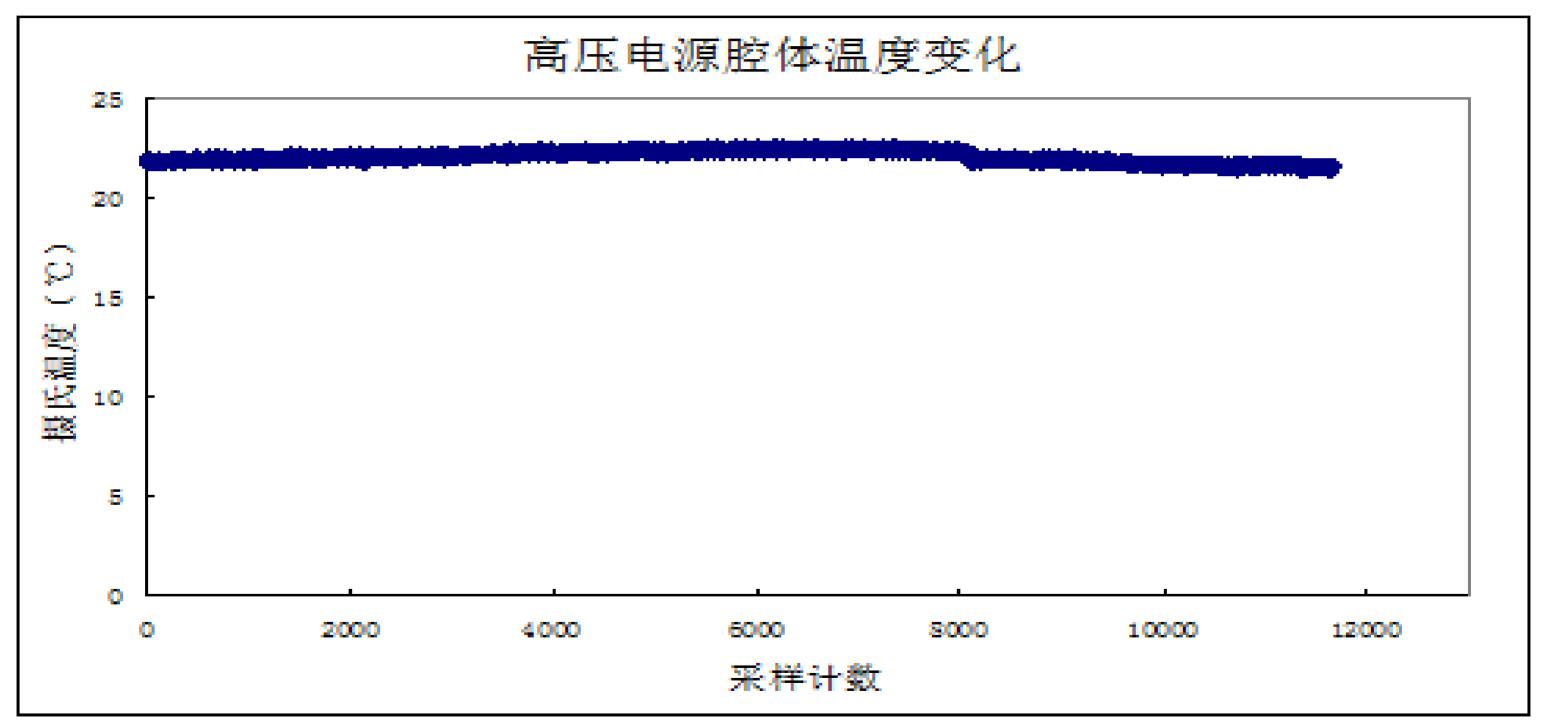


Temp in Control Vessel (Segment)



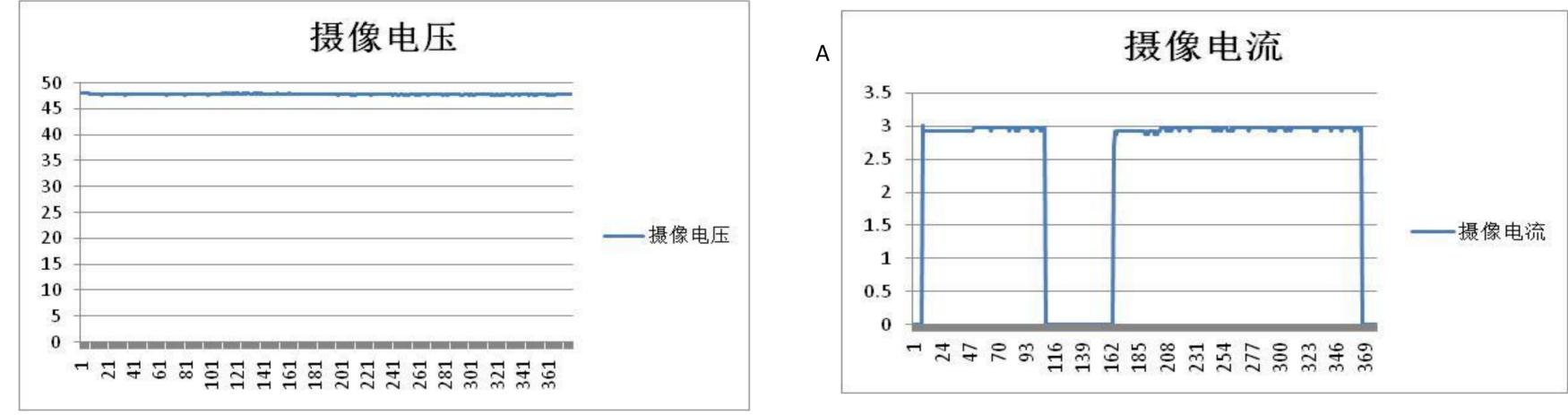
10000	12000	

Temp in 10kV-375V Power Conversion Vessel (Segment)





Power Status (Segment)-Cameral System



Time(s)

V

Time:2010-09-06-12

Time(s)

Secondary Junction Box Connected to MARS

Video Server

Video Camera

Vessel of Communication and Control System

light

Vessel of MV-LV (375V-48V) Converter

1

Deep Sea Trial in Monterey

Apr. 4, 2011-Oct. 25, 2011 Monterey Bay, California Depth: 890m



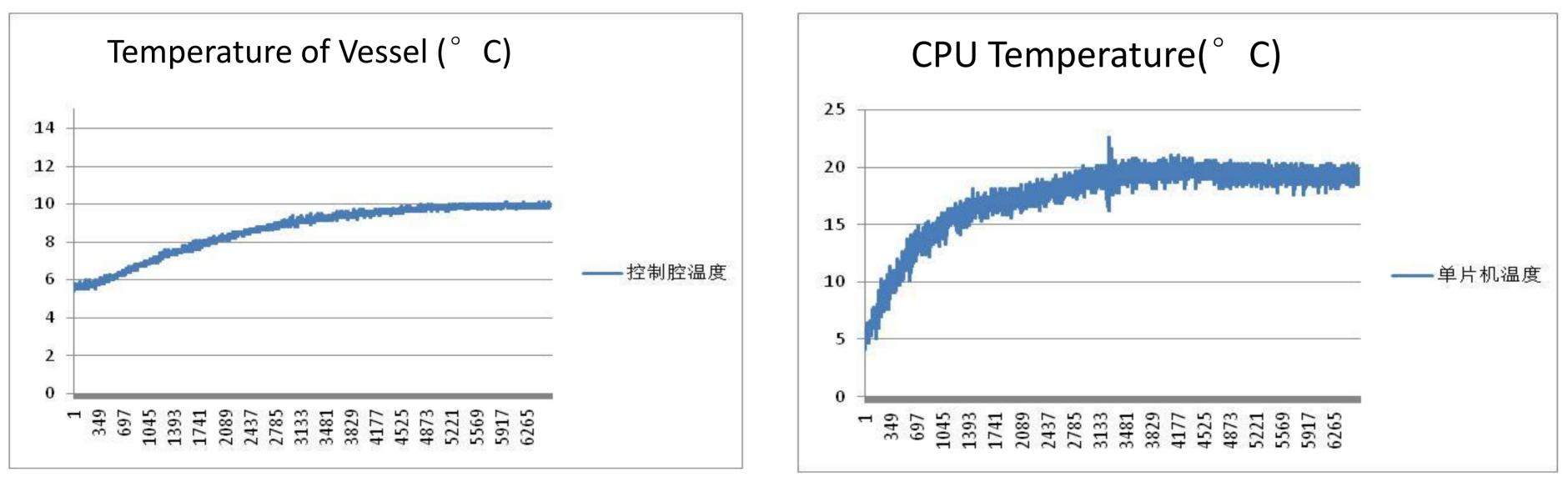






Deep Sea Trial in Monterey

Temp Behavior from the beginning



Time(Second)

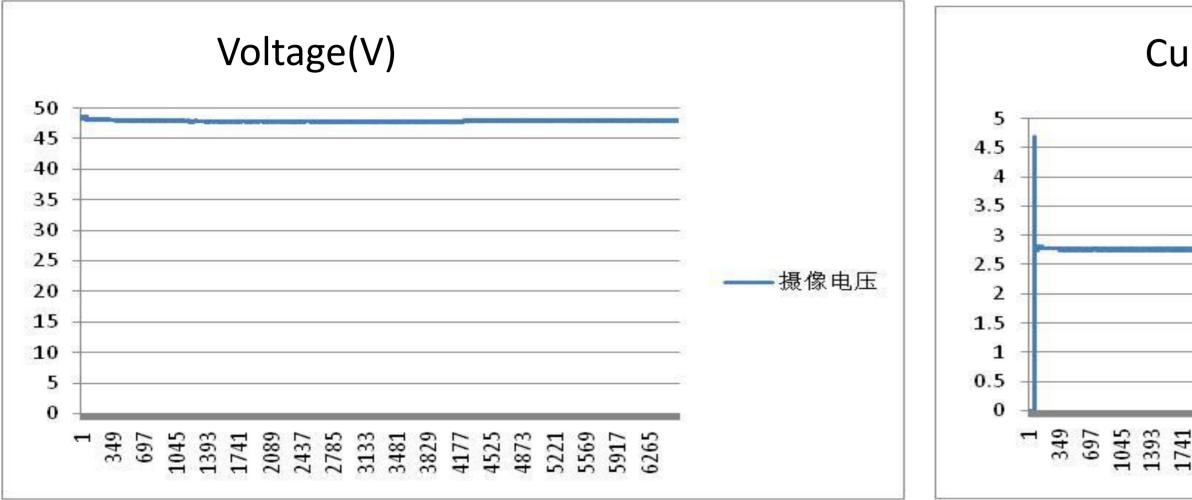
Time : April, 21, 2011, 12:00-14:00 Just Connected to MARS



Time(Second)

Deep Sea Trial in Monterey

Power Status (Segment)-Camera System



Time(Second)

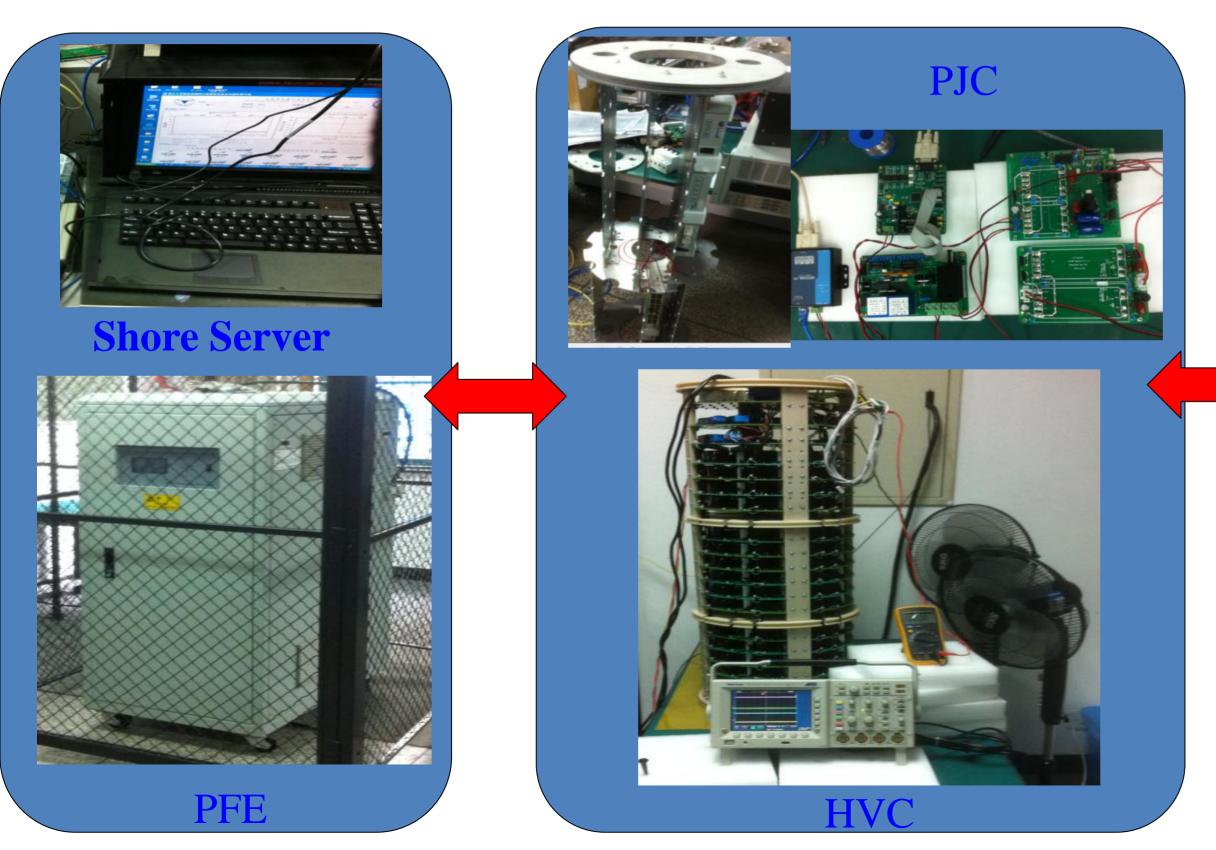
Time(Second)

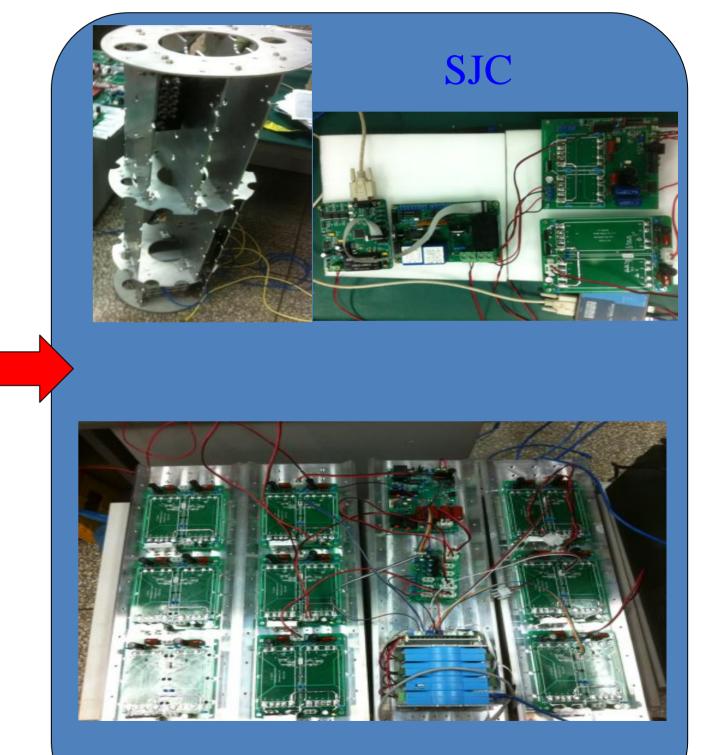
Time : April, 21, 2011, 12:00-14:00 Just Connected to MARS



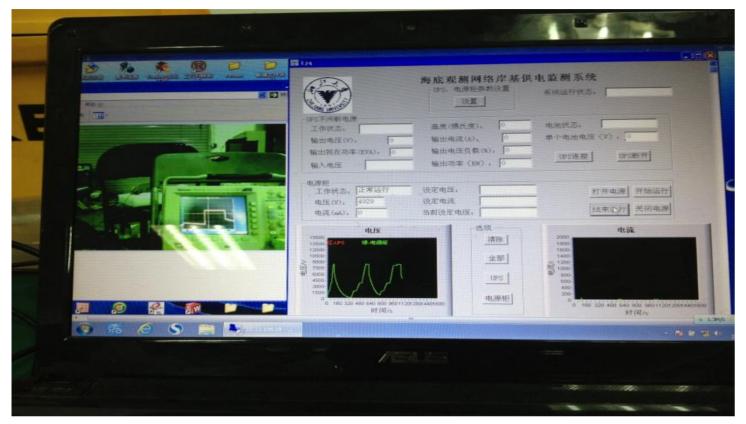
rrent(A)	
	——摄像电流
2089 2437 2785 3133 3133 3481 3481 3829 4177 4177 4177 4525 4873 5569 5569 5917 5917 6265	

Lab Test in 2013





MVC

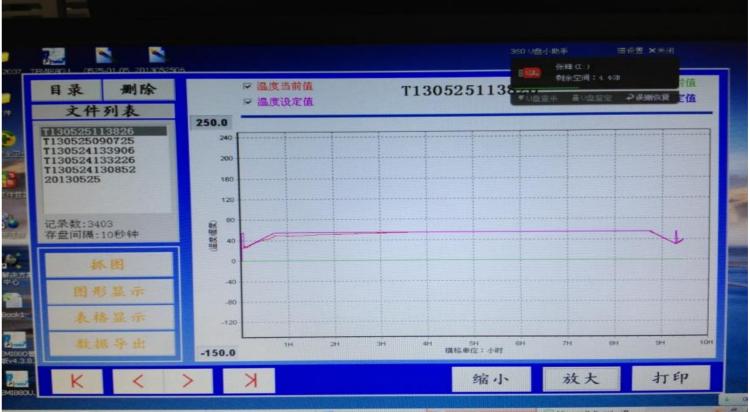


Remote control Test



Vibration Test



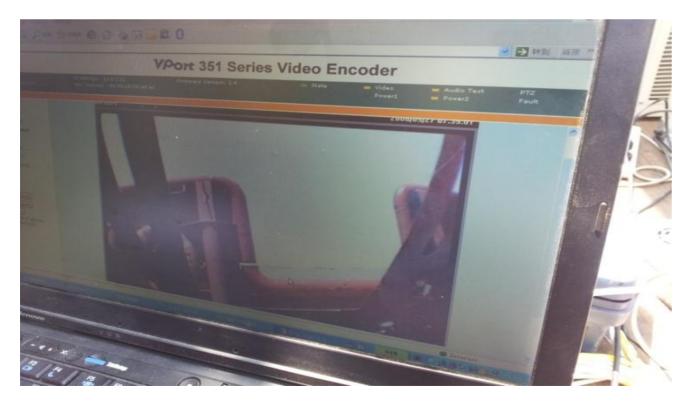


High-Low Temp Test



Lab Test (June 28 – July 2 2013)

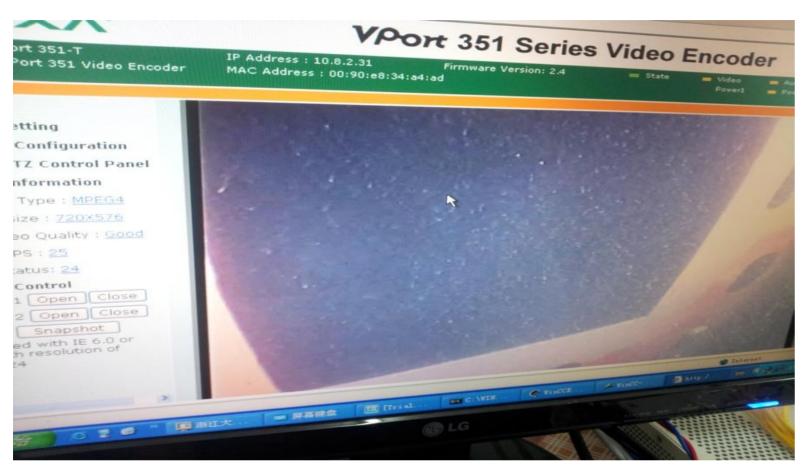








Tank Test with 75 km Submarine Cable



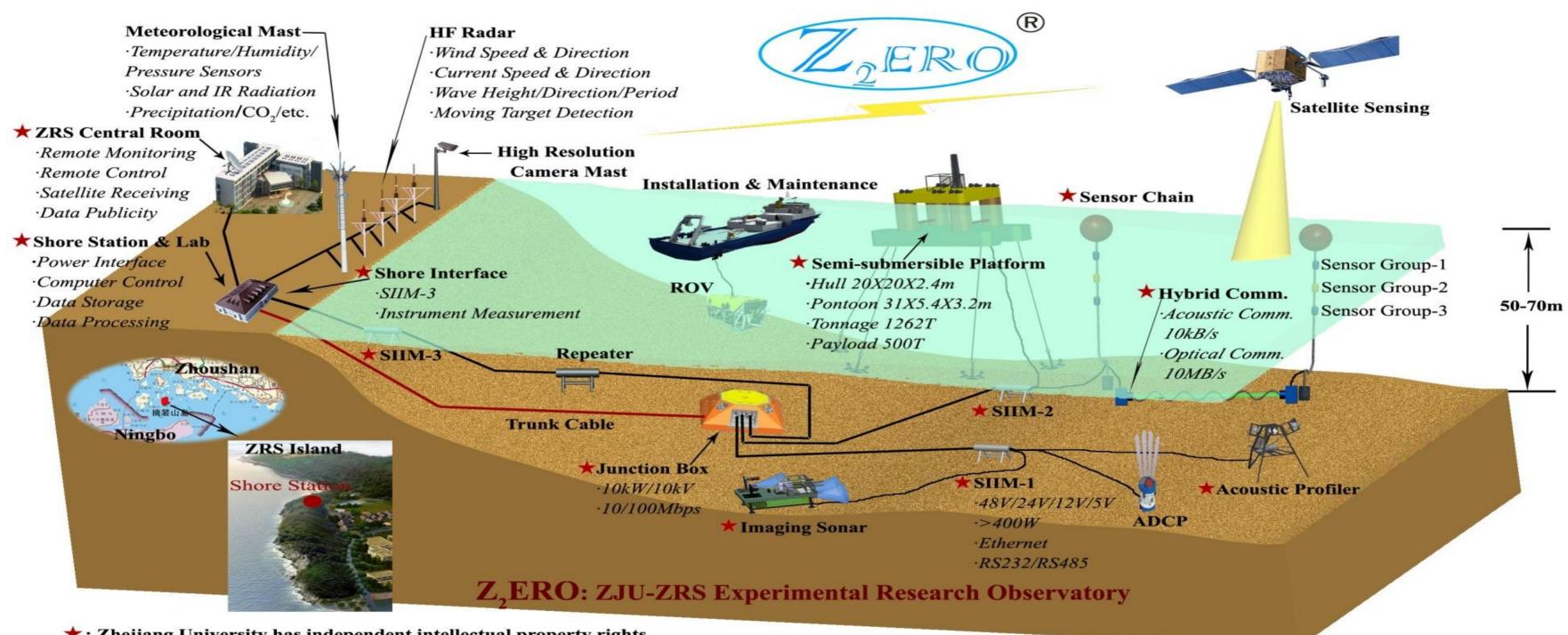




浙江大学海底观测网次级接驳盒低压电能转换系统	
	金低压电能转换系统 ly systems for the second junction box 数据位: 8 校验: None 停止
温度动态折线图	电压电流及功率动态折线图
	<u> </u>
36 34 16 33 34 16 33 34 30 30 29 28 17:42:25 17:42:37 17:42:40 17:43:01 17:43:13 17:43:25 17:43:37 17:43:40 17:44:01 采祥时间	世 4 3 4 3 4 3 5 4 3 5 5 5 5 5 5 5 5 5 5 5 5 5
V TI-0 32.88 V TI-1 29.46 V TI-2 29.91 V TI-3 31.79 V TI-4 31.69 V TI-5 34.71	VI-0 371.3 V AI-0 0.56575 PI-0 210.063
数字量输出控制 电源转换模块正常工作:	电源转换模块停止工作:
通道0 通道1 通道2 通道3	通道4 通道5 通道6 通道7
通道8 通道9 通道10 通道11	通道12 通道13 通道14 通道15

Test in SCS

The Pilot Coastal System-Z2ERO



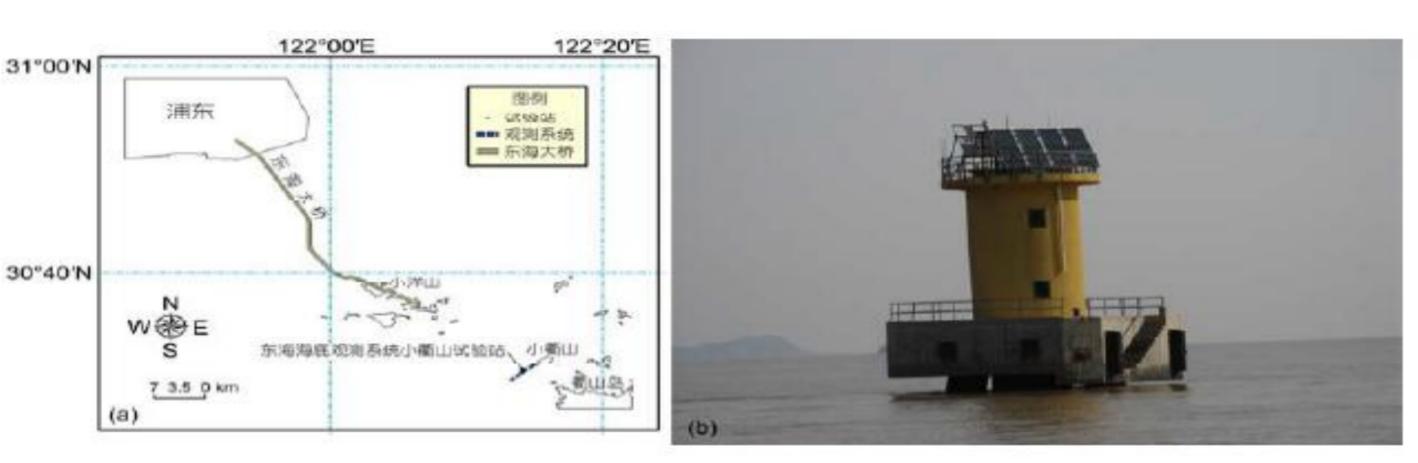
★: Zhejiang University has independent intellectual property rights.

10kV@10kW, 1 Node, 6 km, 1-3 SJboxes, Giga Comm, 30m-70m

Shanghai: Other Projects in China

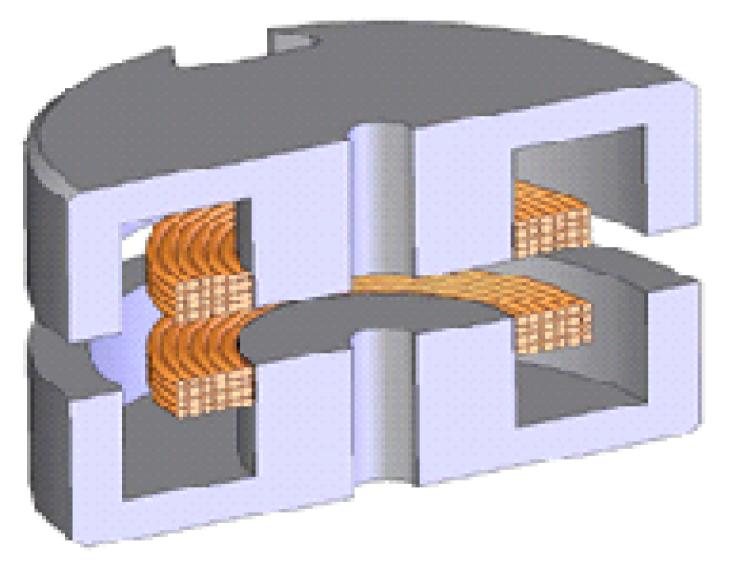
2009 1.1km 15m 48V Sanya: 2013 2km 20m

10kV





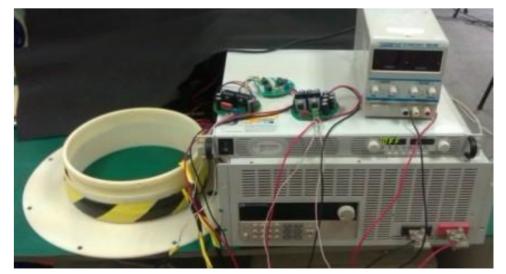
Dream in Green Cabled Observatory **1.Non-contacted Power transfer system**



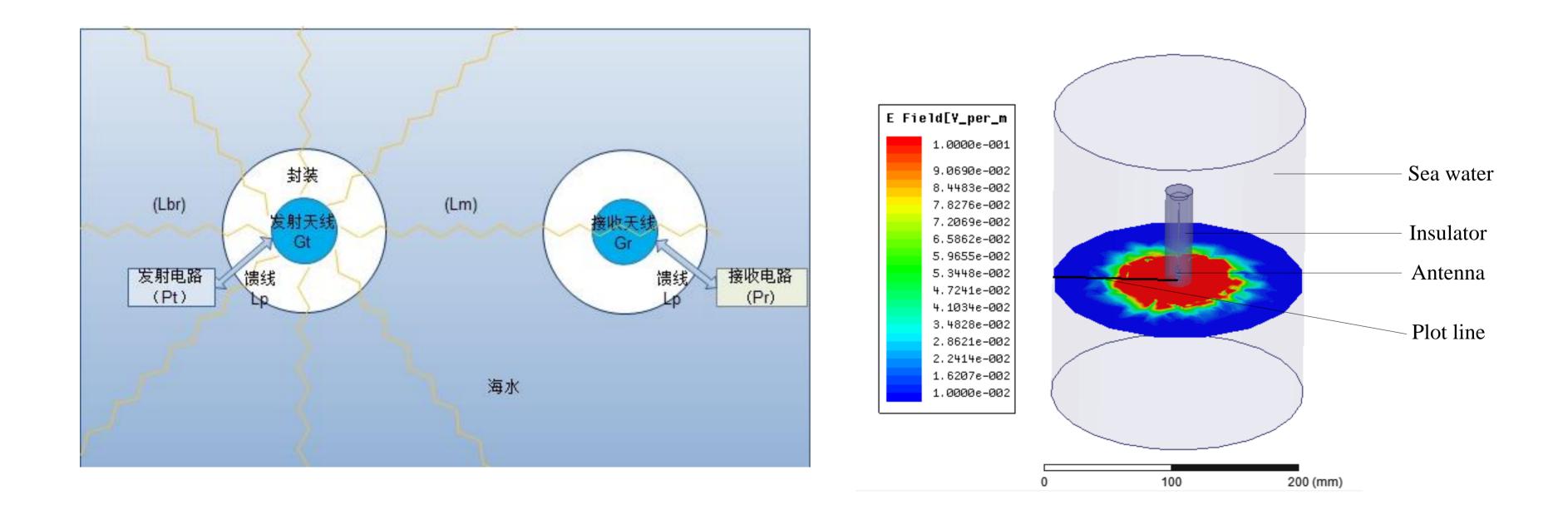
Fire Added 2,1862a-007 0-0131a-007 2,0840a-007	
2.7020m-000 2.6138+007 2.4007m-007 1.3096e-007 2.1396e-007 2.1396e-007	
2,0075a-007 4,0654a-007 1,8105a-007 1,7045a-007 1,7045a-007 1,7711a-007	
L,8810e-007 L,2109e-007 L,2700e-007 L,0407e-007 B,1709e-004	
7,4945e-008 6,5582e-008 5,2430e-008 5,9321e-008 1,6211e-008	
1.100+-00	1







Dream in Green Cabled Observatory 2.Wifi information Transfer in the deep Sea



Thanks for your nice Attention



Happy Mid-Autumn Day 為上計明月,天後共比时 Observation at the same time all over the world ~ when the moon is uprising from the Sea