Satus of GBAR antiproton trap

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GBAR antiproton trap

Contribution

- Beam simulation, trap operation sequence : K.H. Yoo, M. Chung (UNIST)
- Superconducting magnet operation & Maintenance : E. Lim, E.S. Kim(KU)
- Cold UHV beam pipe, Vacuum, RT Test beam pipe : D. Won(SNU)
- Control software, : K.H.Park (SNU)
- Multi-Ring electrodes, Integration CAD : S.C.Chang (SNU)
- Consulting : D.Van der Werf(Swansea), N. Kuroda(Tokyo)

Cold UHV pipe



Status : Two Japanese companies including JASTEC showed interest. Both of them gave up after several months of negotiation(with help of Kuroda). Now 2-3 Korean companies are interested in it. (one made a conceptual design) Purchase process in on going (got approval from the NRF few week ago) Approval from NFEC(presentation on Dec. 6) Bidding process can be started only after the approval from NFEC Bidding : "Open" today !

Cold UHV pipe for the GBAR antiproton trap 사양

항목			단위	사양
재질	챔버			STS316L
	Thermal s	shield		Cu
	Support			알루미늄 프로파일
UHV 챔버 외경 OVC O.D.			mm	406.4
UHV 챔버 높이 (냉동기 제화) al Height(w/o Cryocoole			t mm	779
UHV 챔버 전체 길이 Total length			mm	1944
내측 보아 내경 Bore Chamber I.D			mm	49.2
챔버 보아 외경 Bore Chamber O.D.			mm	90
Thermal shield 외경 Thetmal shield O.D.			mm	78
보어 중심 높이 Bore center height			mm	1200
UHV 챔버 전체 높이 Total height			mm	1886
UHV 챔버 전체 무게 Total weight		kg	~ 350	
단열 방식	Thermal insulation			진공 및 MLI 시공
극저온 냉동기 (RDK-415D)	수량		set	2
	냉각용량	@ 30K	w	30
		@ 4.2K	w	3
Heat Loss	@ 50K		w	~ 16.4
	@ 4.2K		W	~ 0.835
Leak rate			mbar.l/sec	< 1 x 10 ⁻¹⁰

Multi-Ring Electrodes





Status : All components are ready (including wires, bolts & nuts) Assembly was tested We will try insert it in the UHV pipe (test beam pipe : under re-built)

Antiproton Trap



Current decelerator setup





Current decelerator setup





L1(1705)+Tchamber(345)+L2(338+24+22=384)=2435 mm

+One tube upstream ~ 2700 mm

+DN160~ 2800 mm

+ Q. Triplt dimension could be adjusted

Summary

- SC solenoid magnet is at KU sejong campus (now at RT)
- MRE components are ready, amplifiers for electrodes are being prepared
- Electron gun is almost ready
- Cold UHV pipe : delayed
- Extraction scheme is being designed, improved
- RT vacuum system and electron beam test setup is being built
- Control & monitoring with CRIO & PXI under development
- Plan
 - RT test with electron beam
 - Fabrication of CUHV pipe before summer 2019
 - Integration with magnet and vacuum system, electron beam test with CUHV pipe at KU
 - Installation at GBAR zone before the end of 2019