Bubble Chamber Planning Meeting

04 September 2013

Agenda

1. Bubble Chamber progress at Argonne
2. Superheated Liquids to be used in the experiment
3. Computer Center support: mailing list, group disk, wiki page
4. Beamline Layout
5. Bubble Chamber cost estimate: procurement and labor
6. Error Analysis

Superheated Liquids

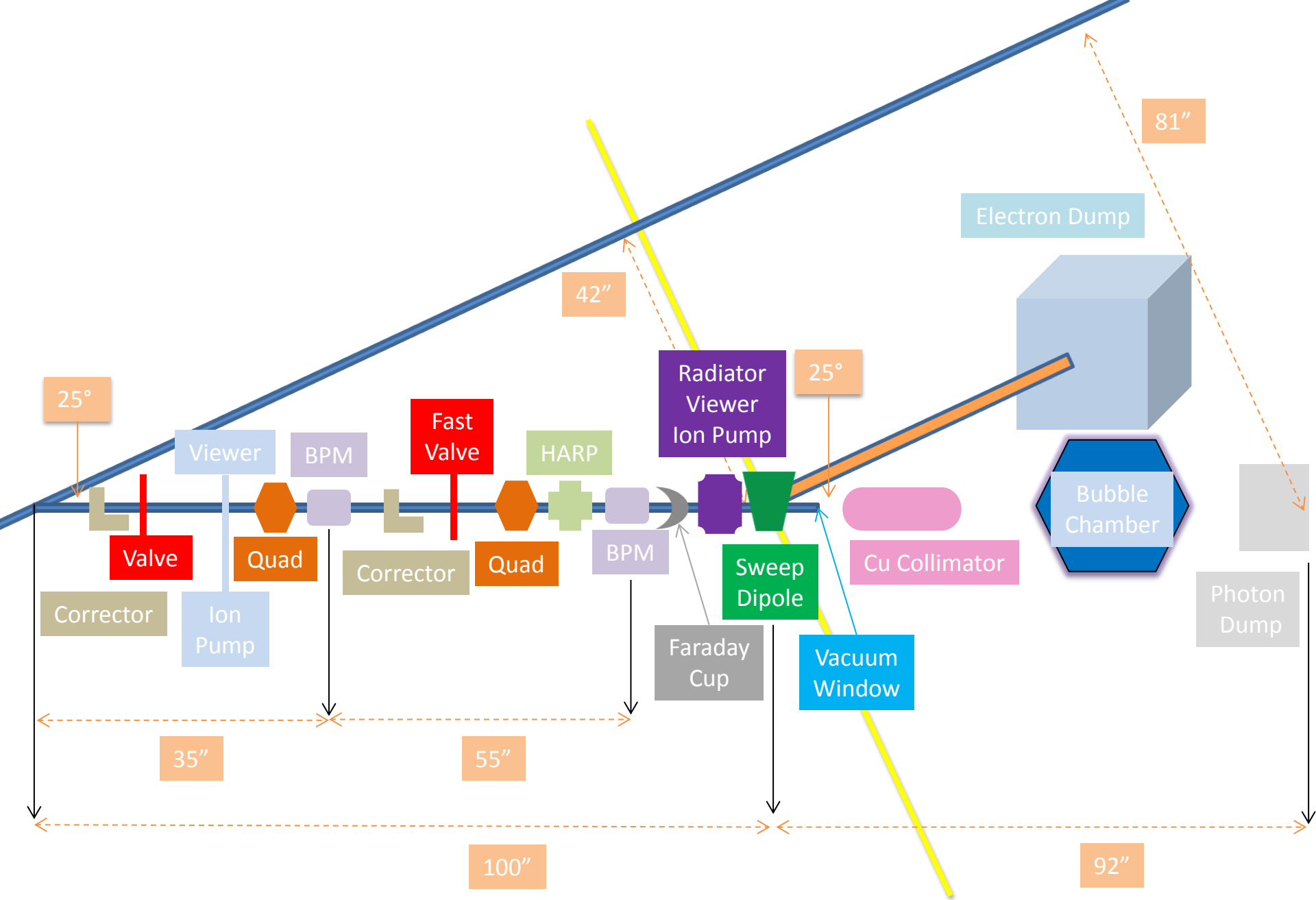
I. List of superheated liquids to be used in the experiment:

N_2O Target	^{16}O	^{17}O	^{18}O
Natural Target	99.757%	0.038%	0.205%
^{16}O Target		Depleted > 5,000	Depleted > 5,000
^{17}O Target		Enriched > 10%	Depleted > 5,000
^{18}O Target		Depleted > 5,000	Enriched > 10%

Beamline Layout

I. Will not install BPM on Spectrometer line
II. 2 Super Harps to measure beam profile and absolute beam position
III. Fast Valve to protect from vacuum failure
IV. Do we want a vacuum pipe to connect the vacuum window to the chamber?
V. Electron Dump: isolated to measure beam current, 2 kW
VI. Beam Properties at Radiator:

Beam Kinetic Energy, (MeV)	3.0 – 8.5
Beam Current (μA)	0.01 – 100
Absolute Beam Energy	0.1%
Relative Beam Energy	0.1%
Energy Resolution (Spread), σ_T/T	0.06%
Beam Size, $\sigma_{x,y}$ (mm)	1 – 2


81”
Electron Dump
42”
25°
Radiator
Viewer
Ion Pump
25°
Fast
Valve
Viewer
BPM
HARP
Bubble
Chamber
Valve
Quad
Corrector
Quad
BPM
Sweep
Dipole
Cu Collimator
Corrector
Ion
Pump
Faraday
Cup
Vacuum
Window
Photon
Dump
35”
55”
100”
92”

Cost Estimate

I. Radiator motion and Sweep Dipole must be in FSD

II. BCM0L02 and Electron Dump in Beam Loss Accounting (BLA)

III. New beamline components: 2 Super Harps + Fast Valve

IV. Summary of labor cost by group:

Group	Labor
Survey & Alignment	3 wks x 2
Magnet Test	1 wk x 2
Engineering Design	12 wks
Software	3 wks x 2
EES	6 wk x 2
EH&Q	4 wks

Item	Material Procurement	Shop	Labor
New Dipole Magnet	Dipole Magnet ($8,000) Hall Probe ($2,000)		Mapping (1 week) EESDC (1 week) Alignment (2 days)
New Power Supply	Power Supply ($5,000)		Software (2 weeks)
New Beamline	2 Super Harps and Fast Valve ($30,000)	Pipes + Pedestals ($20,000)	Design (6 weeks) Alignment (1 week) Software (4 weeks) EES (5 weeks)
Radiator (cooled ladder, FSD)	0.02 and 0.10 mm Cu foils ($2,000)	$4,000	Design (2 week) Alignment (2 days)
Sweep Dipole			
Electron Dump	Pure Cu ($5,000)	Dump + Pipes ($15,000)	Design (2 week) Alignment (1 day)
Cu Collimator	Pure Cu ($5,000)	Collimator + Stand ($5,000)	Design (1 week) Alignment (1 day)
Photon Dump & Stand	Pure Al ($3,000)	$4,000	Design (1 week) Alignment (1 day)
Safety Review			4 weeks
Install			6 weeks
Bubble Chamber			Alignment (1 week)
Total	$60,000	$48,000	$60,000
Total (with overhead)	$75,000	$60,000	$90,000