Search for a location for installation of the BGV vacuum chamber & detector

- Visit at IP4 for a check on the spot (21/12/2012) and follow-up actions

- Table and drawings of selected locations (png and pdf versions of the figures can be found on https://twiki.cern.ch/twiki/bin/view/BGV/Documents)

Table 1 summarizes the investigated zones which were found to be free of other equipment. To know if we can use them, we need to estimate the effect from the beam-gas-induced radiation on the surrounding equipment.

Table 1: Zones around IP4 not occupied by beam instruments or magnets. The locations of the Q5 and Q6 magnets are given for guidance. The z coordinates are given with respect to IP4 (minus sign for the left side of IP4). The distance between IP1 and IP4 is 9997 m.

Zone	z start [m]	z end [m]	Instrument/Magnet	
			on the left	on the and right
BGVL1	−85	−115	D4L4, BPLV	BWS
BGVR1	86	117	BWS	D4R4
Q5L4	−129	−136	-	-
Q5R4	129	136	-	-
BGVL2A	−137	−148	BTVMs	BQKH
BGVL2B	−149	−164	BQKV	BTVMs
BGVR2	141	150	BPLVs, BQKH	BPLX, BCTDCs, BCTFRs
Q6L4	−166	−173	-	-
Q6R4	166	173	-	-
BGVL3	−175	−246	Q7L4	BPLHs
BGVR3	179	245	BPLH, BPLV	Q7R4

Note that zone BGVL2A corresponds approximately to BGVR2, while zone BGVL2B has no equivalent on the right side, as the space is occupied by BPLX, BCTDCs and BCTFRs.

Action 1: Estimate the rates of beam-gas interaction products
As a first step, Plamen will check the charged/neutral particle rates R, and then estimate dR/dη vs η. Checks to be made with with H, O, and Xe residual gas. To be discussed how to proceed once the results from these checks are ready. More realistic simulations can be made e.g. with FLUKA.

Action 2: Check the current estimates of the precision on β, and their dependence on the exact z-location
K-modulation method (the preffered method) gives β estimates only at the location of the quadrupole magnets (?)
Plamen to get understanding of the β measurements and their reliability.

Action 3: Compare implications of each choice of location:
β and aperture values; detector layout; precision