Radiation Environment Comparisons for the Time-Resolving Detectors at 15W (a-C), 15E (DLC), 49W2 (TiN) and 49W4 (Al)

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Ad Hoc Electron Cloud Meeting for L3 Measurement Goals

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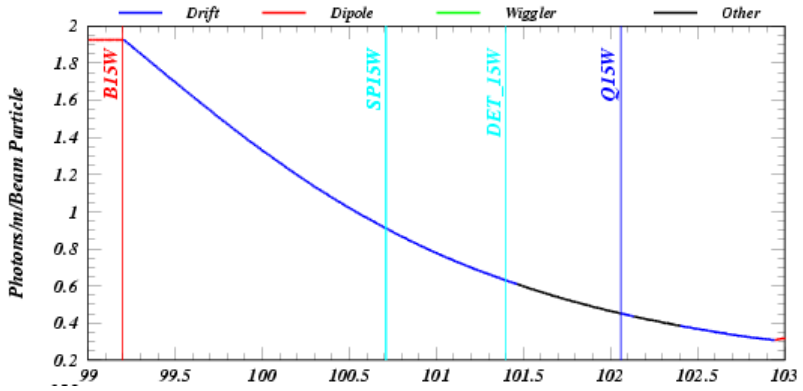
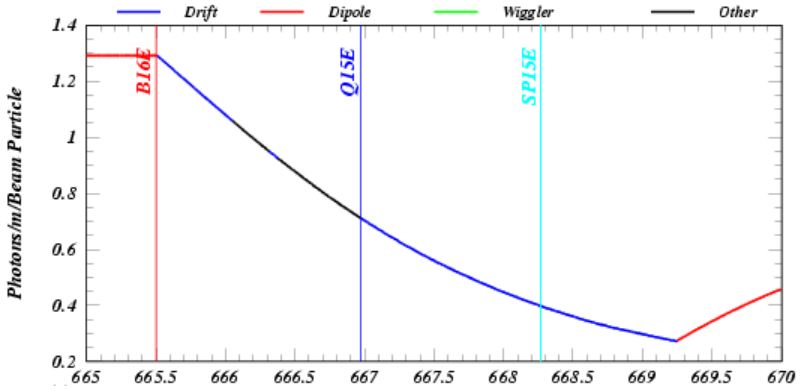
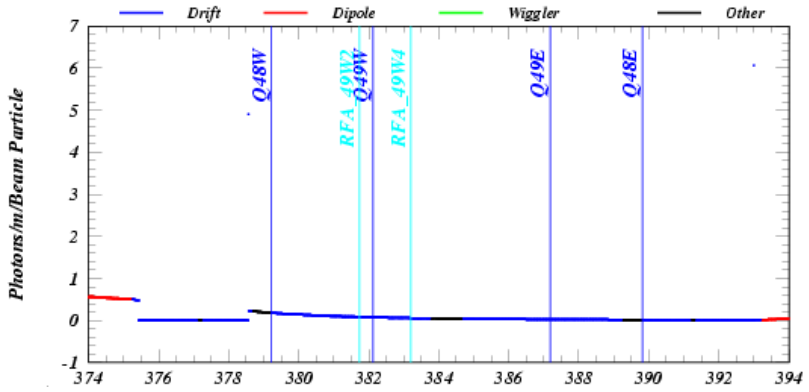
Positron Beam Direct Photon Rates from SYNRAD (no photon scattering)

15W (a-C)



15E (DLC)





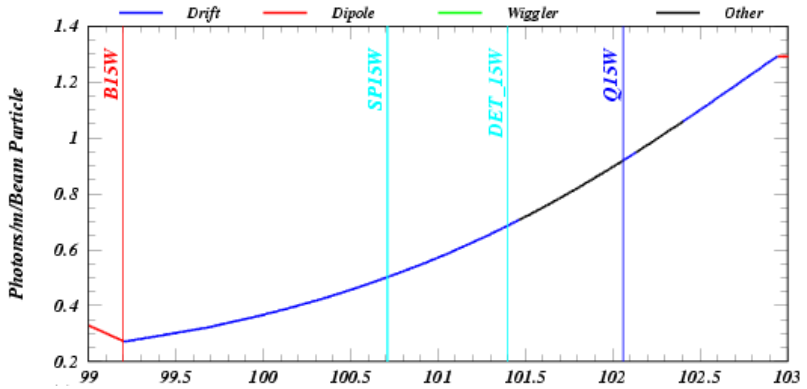
49W2 (TiN)

49W4 (Al)

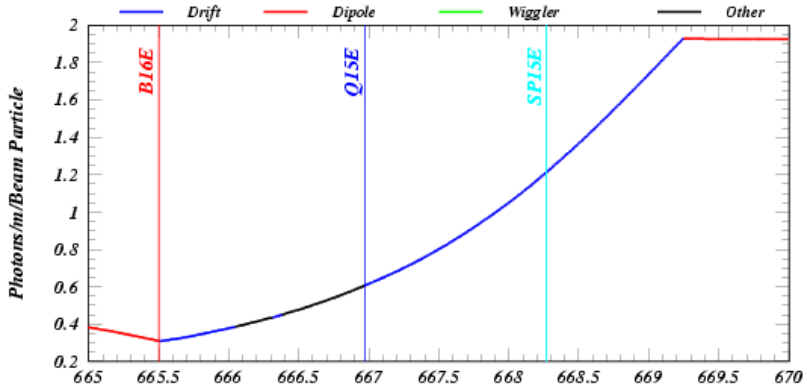
The direct rates at 49W are at least a factor of 5 lower than at 15E/W.
Howevever, the SYNRAD3D results to follow show that the contribution from scattered photons can be much larger.

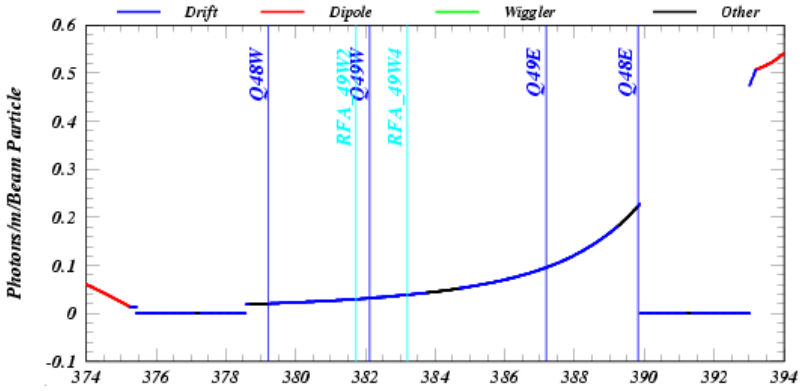
Electron Beam Direct Photon Rates from SYNRAD (no photon scattering)

15W (a-C)



15E (DLC)





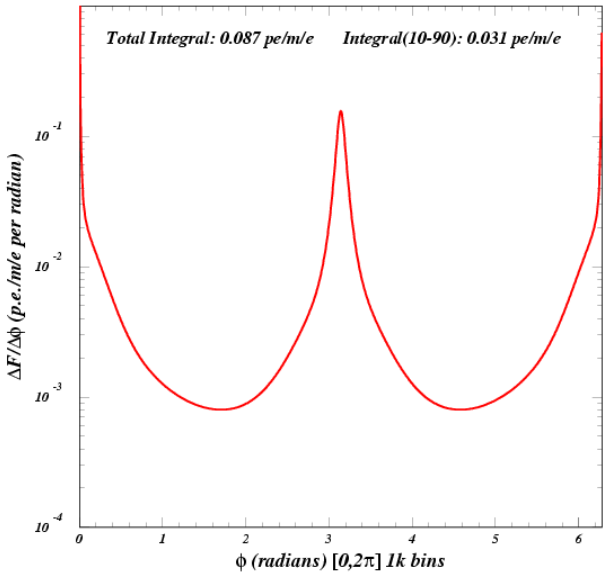
49W2 (TiN)

49W4 (Al)

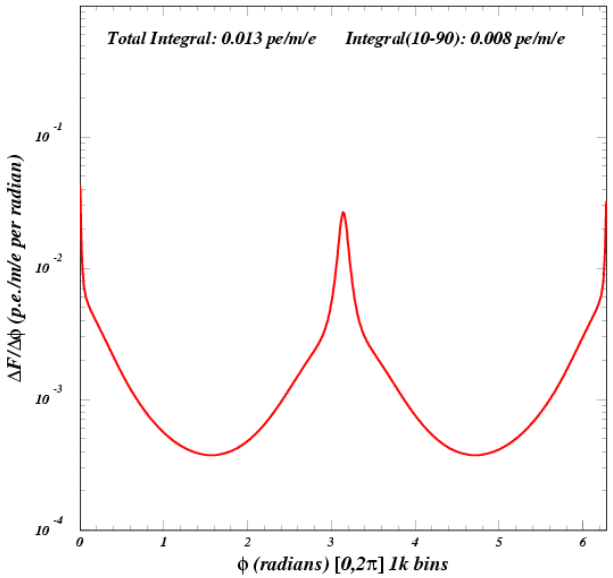
The direct rates at 49W are at least a factor of 10 lower than at 15E/W.
The SYNRAD3D results to follow show that the contribution from scattered photons is NOT much larger.

Positron Beam Photon Distributions from SYNRAD3D
p.e./m/e rates assume 10% quantum efficiency

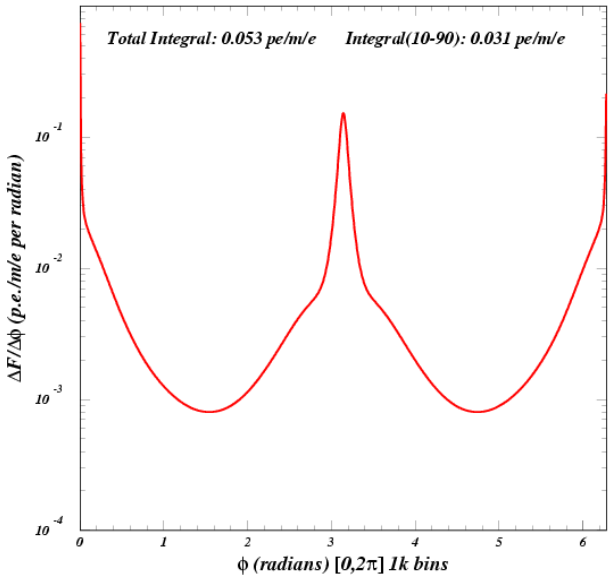
15W (a-C)



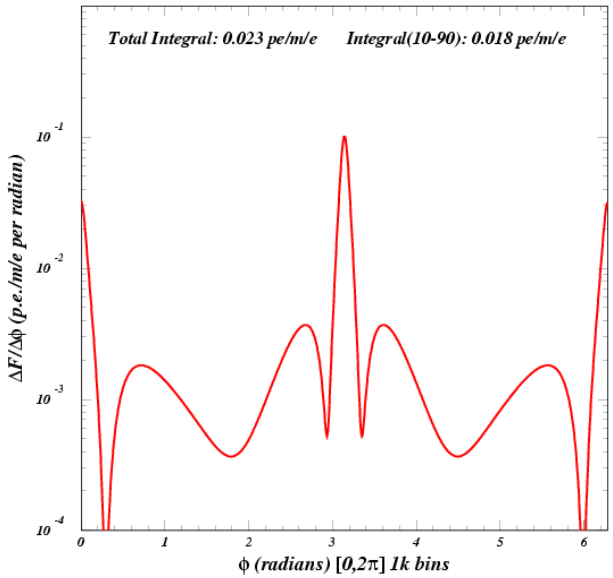
49W2 (TiN)



15E (DLC)

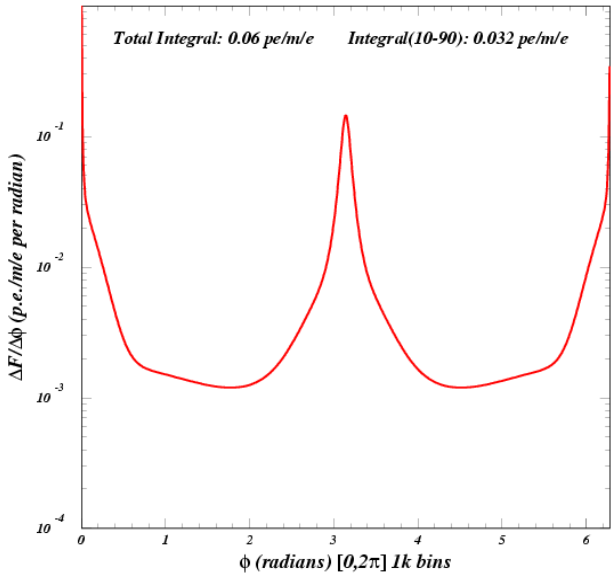


49W4 (AL)

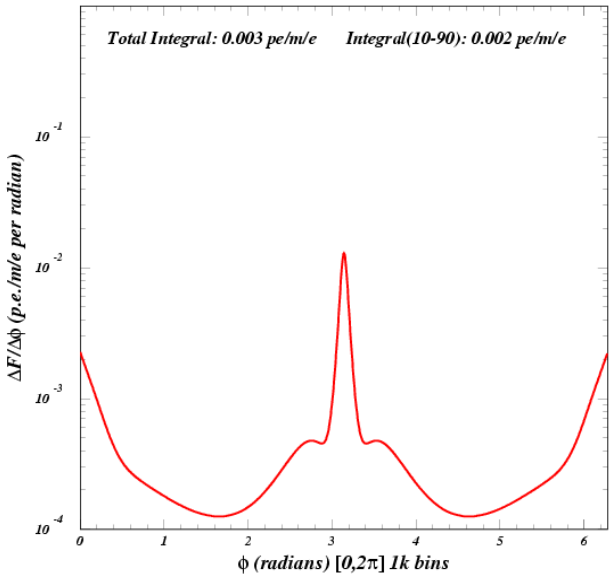


Electron Beam Photon Distributions from SYNRAD3D
p.e./m/e rates assume 10% quantum efficiency

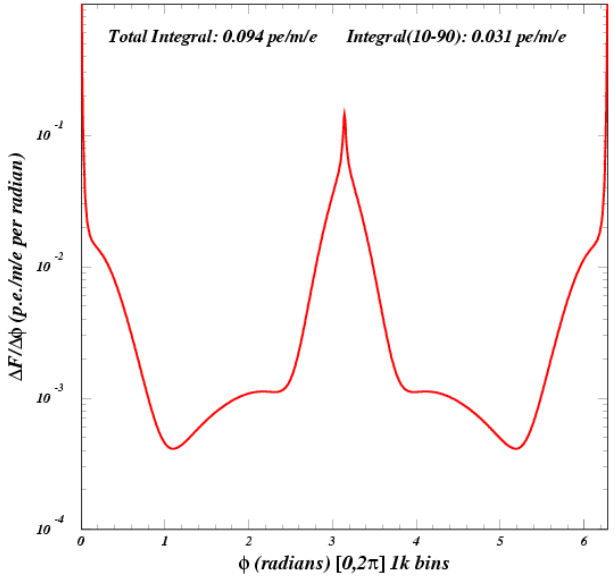
15W (a-C)



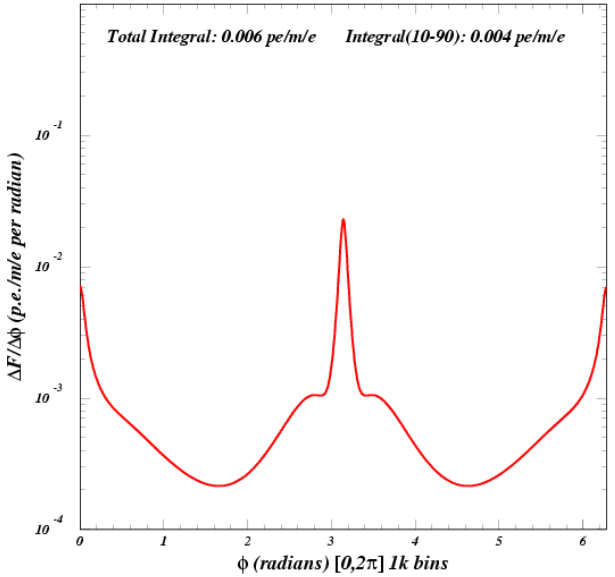
49W2 (TiN)



15E (DLC)



49W4 (AL)



15E/W and 49W2/4 Radiation Environments and SYNRAD/SYNRAD3D Comparison

	15W (a-C)		15E (DLC)		49W2 (TiN)		49W4 (Al)	
S (m)	100.71		668.27		381.73		383.20	
	e+	e-	e+	e-	e+	e-	e+	e-
Distance to source (m)	2.83	3.54	3.91	2.54	7.19	11.85	8.53	10.44
Source dipole	B15W	B16W	B16E	B15E	B48W	B48E	B48W	B48E
Field strength (kG)	3.0	2.0	2.0	3.0	1.25	1.25	1.25	1.25
Dipole length (m)	6.57	6.57	6.57	6.57	2.95	2.95	2.95	2.95
Distance to dipole (m)	1.53	2.22	2.79	0.97	6.48	11.46	7.95	10.0
Critical Energy (keV) (direct photons)	5.6	3.7	3.7	5.6	2.4	2.4	2.4	2.4
SYNRAD direct rate (photons/m/e)	0.9	0.5	0.4	1.2	0.08	0.03	0.06	0.04
SYNRAD3D total rate (photons/m/e)	0.87	0.60	0.53	0.94	0.13	0.03	0.23	0.06