Review Eurados Intercomparison 2009 for extremity dosemeters

Organising Group (OG):

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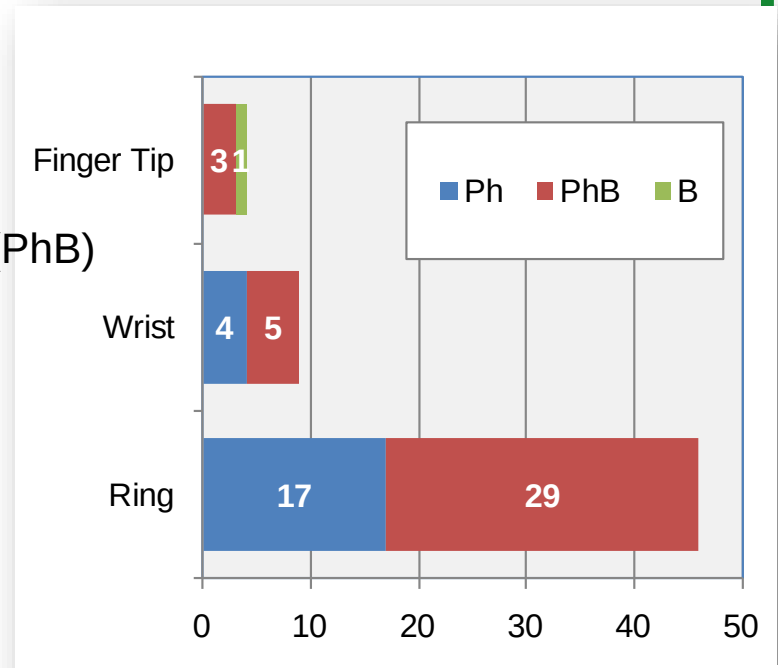
2009 intercomparison project

- Extremity dosemeters (ring, finger tip, wrist/ankle)
- Both photon and beta irradiations
- 45 institutes from 18 countries
  - ($IC2015_{ext}$: 52 institutes, 22 countries)
- 59 dosimetry systems
  - ($IC2015_{ext}$: 72 systems)
- Irradiations performed by
  - Seibersdorf laboratories (A)
  - IRSN (F)
- Coordination by NRG

Dosemeter types

Radiation type
- Photon dosemeter (Ph)
- Photon and beta dosemeter (PhB)
- Beta dosemeter (B)

Hanger type
- Ring dosemeter
- Wrist dosemeter
- Finger tip dosemeter



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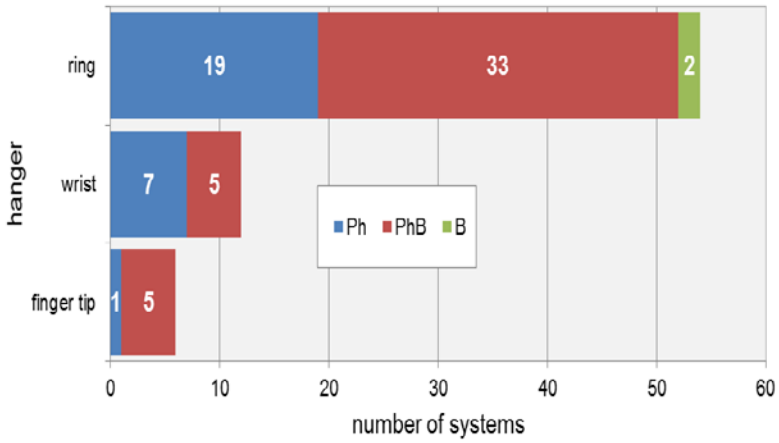
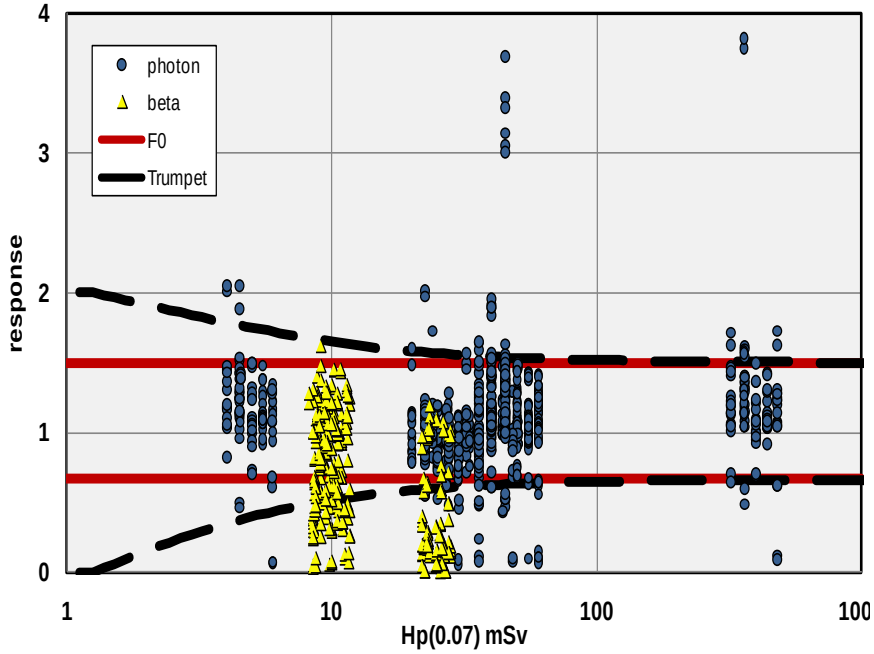


Ring Dosimeters

Radiation plan (beta and photons)

Radiation	Quality	Nr	Hp(0.07) mSv	Min mSv	Max mSv
Beta	**Kr-85; 0°**	B1	**24.8**	22.0	28.2
	Sr-90/Y-90; 0°	B2	**9.8**	8.2	11.5
	Sr-90/Y-90; 60°	B3	**9.8**	8.5	11.7
Photon	**N-20; 0°**	P1	**39.4**	32.1	48.0
	W-80; 0°	P2	**4.9**	4.0	6.0
		P3	**49.3**	39.9	60.3
		P5	**394.1**	320.0	480.0
	W-80; 60°	P4	**49.3**	40.0	60.2
	N-150; 0°	P6	**24.6**	20.0	30.1
	S-Cs; 0°	P7	**29.8**	24.0	36.0

All response values



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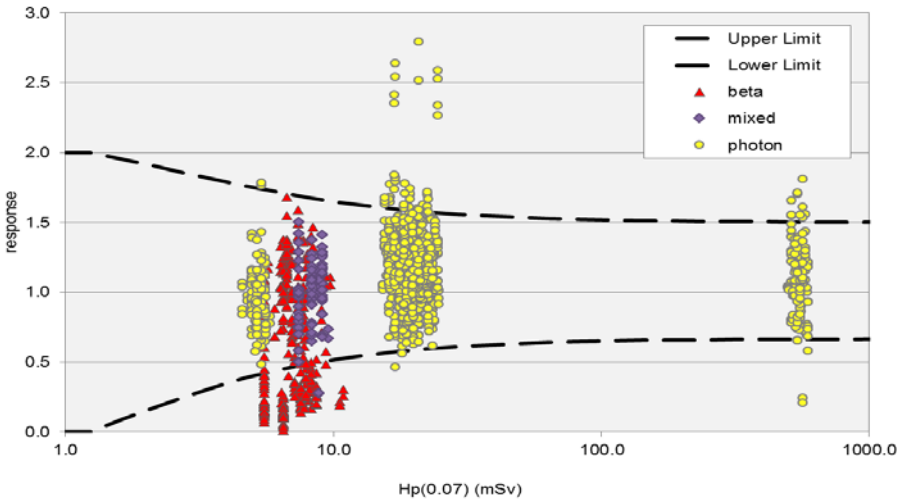
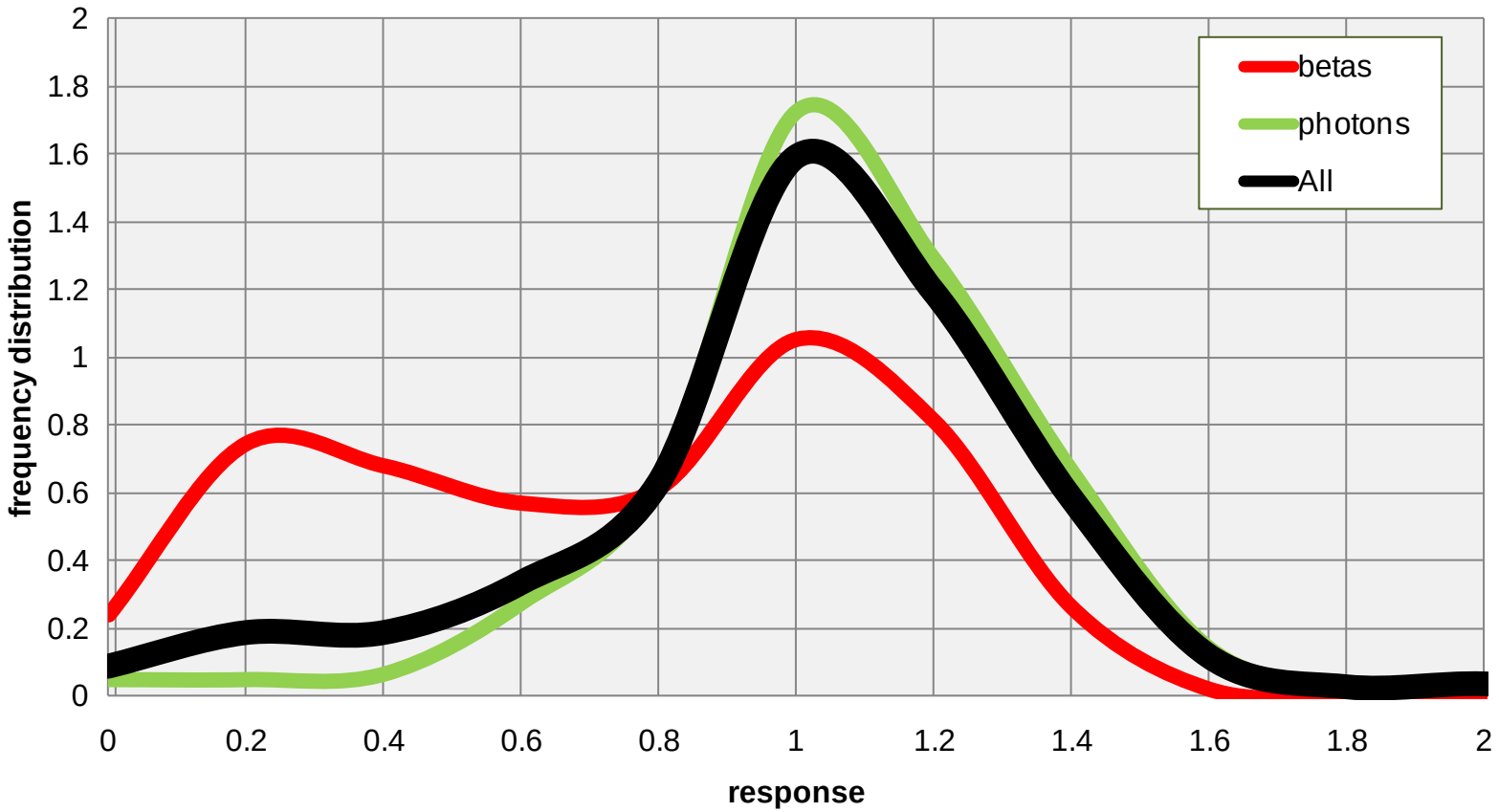
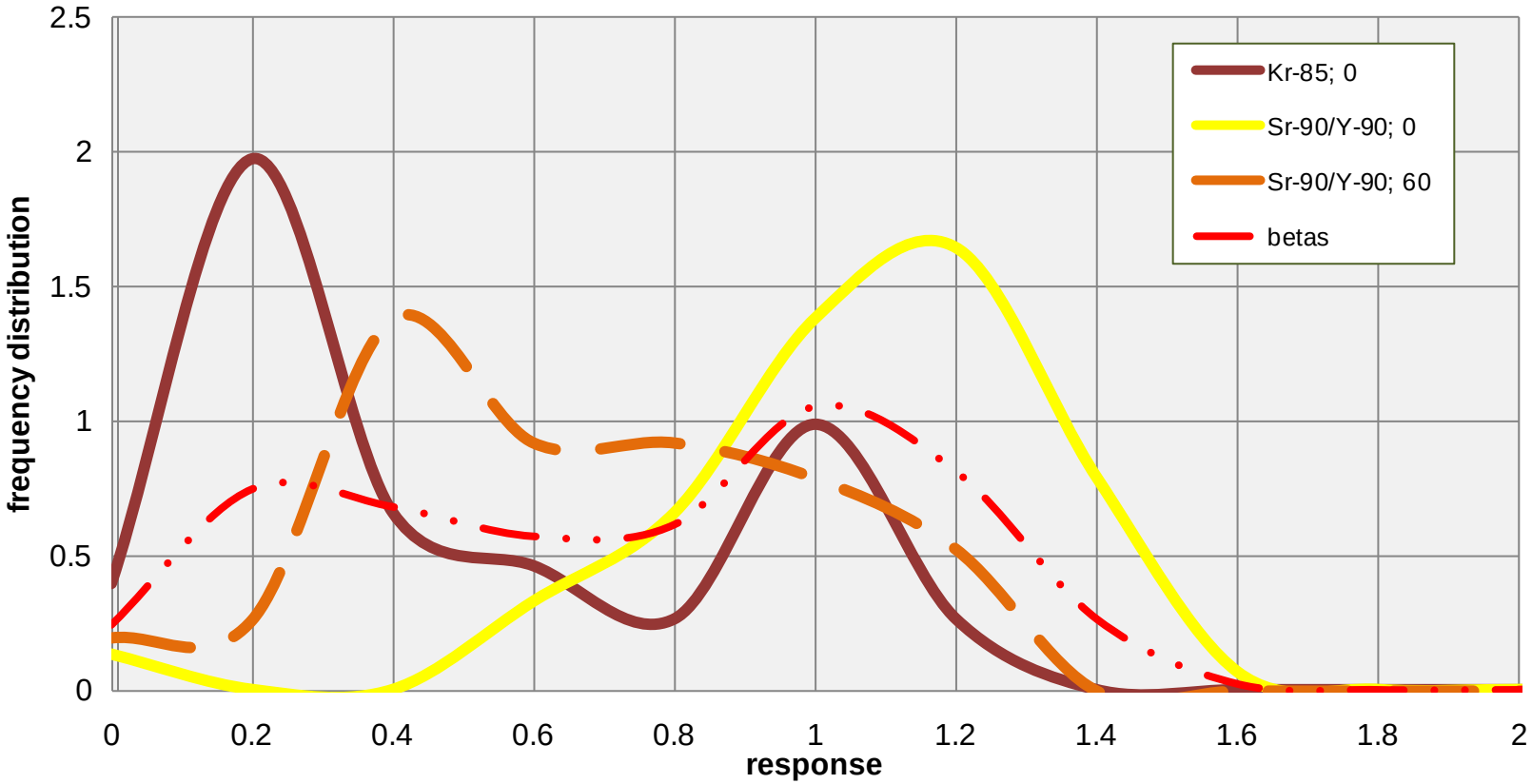


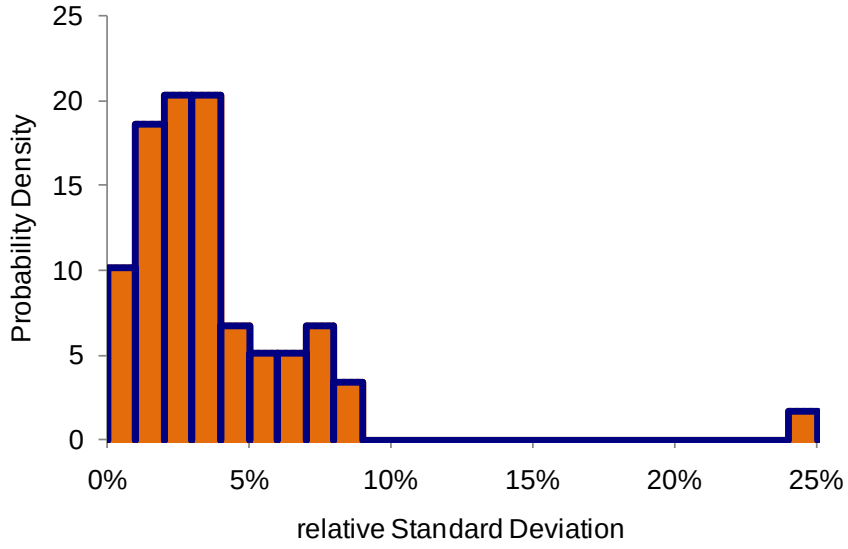
Frequency distribution



Frequency distribution (beta)



Reproducibility



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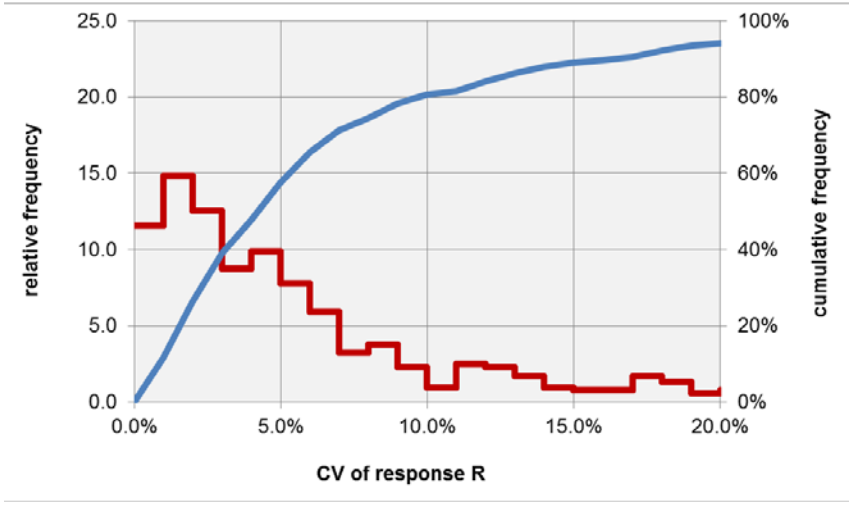

Outliers

Outliers	Outliers	Quality	Ph	PhB	B	All
Beta	Beta	Kr-85; 0°	-	64%	100%	65%
		Sr-90/Y-90; 0°	-	3%	-	3%
		Sr-90/Y-90; 60°	-	41%	50%	41%
Beta all	**Beta all**		**-**	**36%**	**50%**	**36%**
Photon	Photon	N-20; 0°	15%	12%	-	13%
		W-80; 0°	10%	11%	-	11%
		W-80; 60°	13%	9%	-	11%
		N-150; 0°	10%	14%	-	12%
		S-Cs; 0°	8%	7%	-	7%
	Photon all		**11%**	**11%**	**-**	**11%**
Photon	**All**		**11%**	**18%**	**50%**	**16%**
All		**11%**	**18%**	**50%**	**16%**	**19%**

Conclusions 2009ext

- Most systems perform well, but some very bad
- Most outliers for beta radiation:
  - Kr-85, because of low energy
  - Sr-90/Y-90 60°, because of angle (increases effective thickness filter)
- Reproduceability for most systems very good (< 4%)


Thank you for your attention