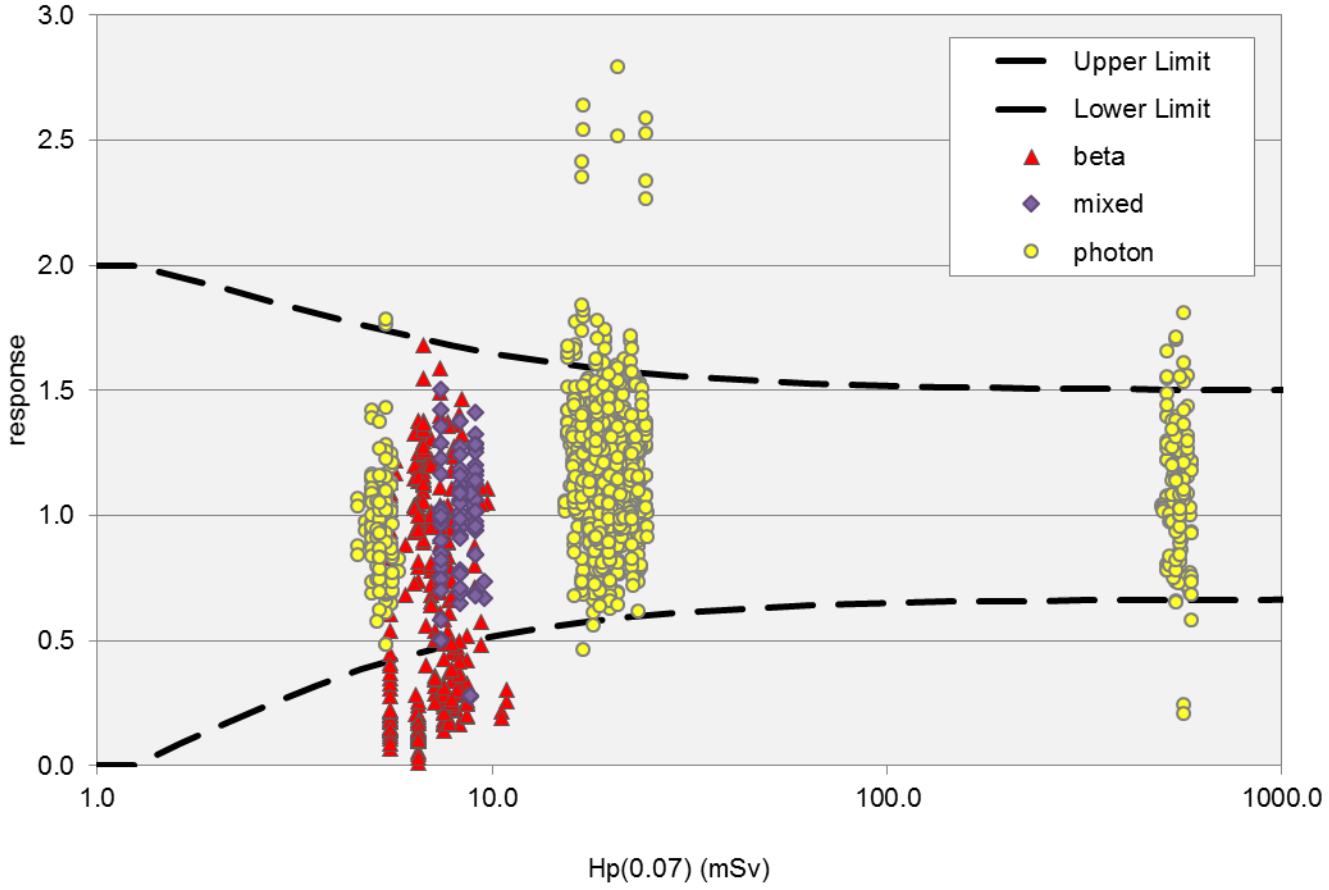
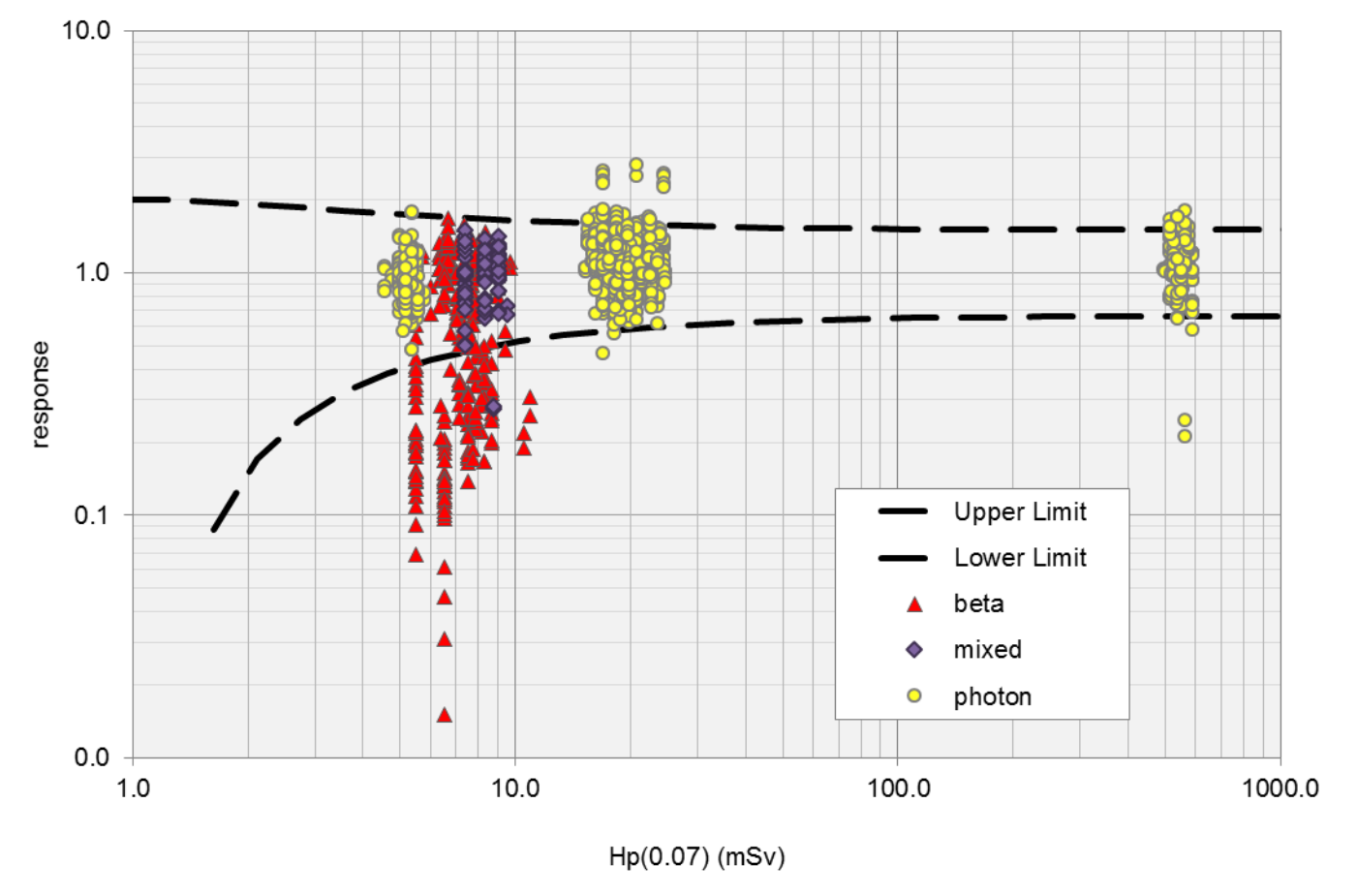
EURADOS INTERCOMPARISON IC2015$_{ext}$ ANALYSIS AND RESULTS

Hannes Stadtmann

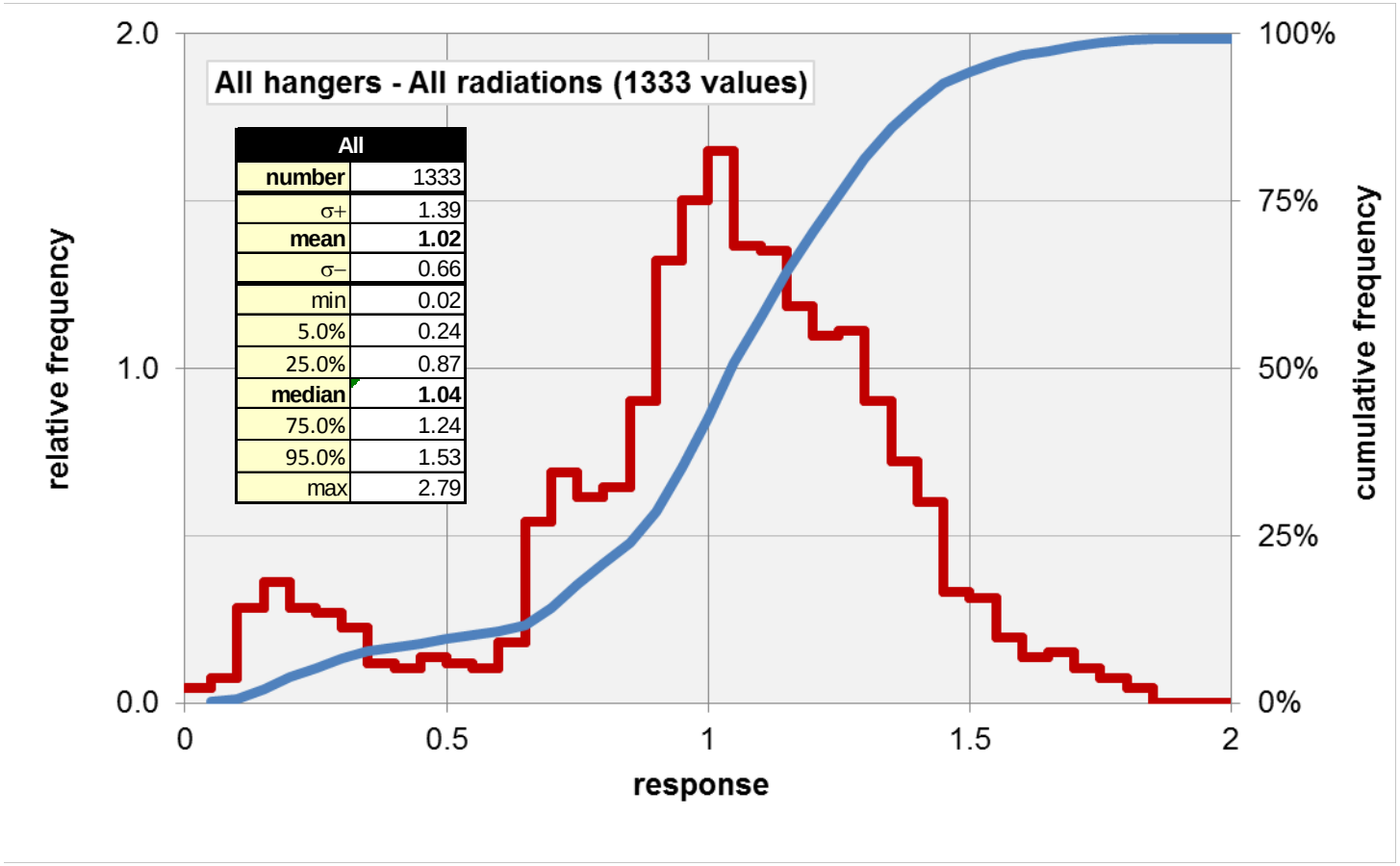
Trumpet curve



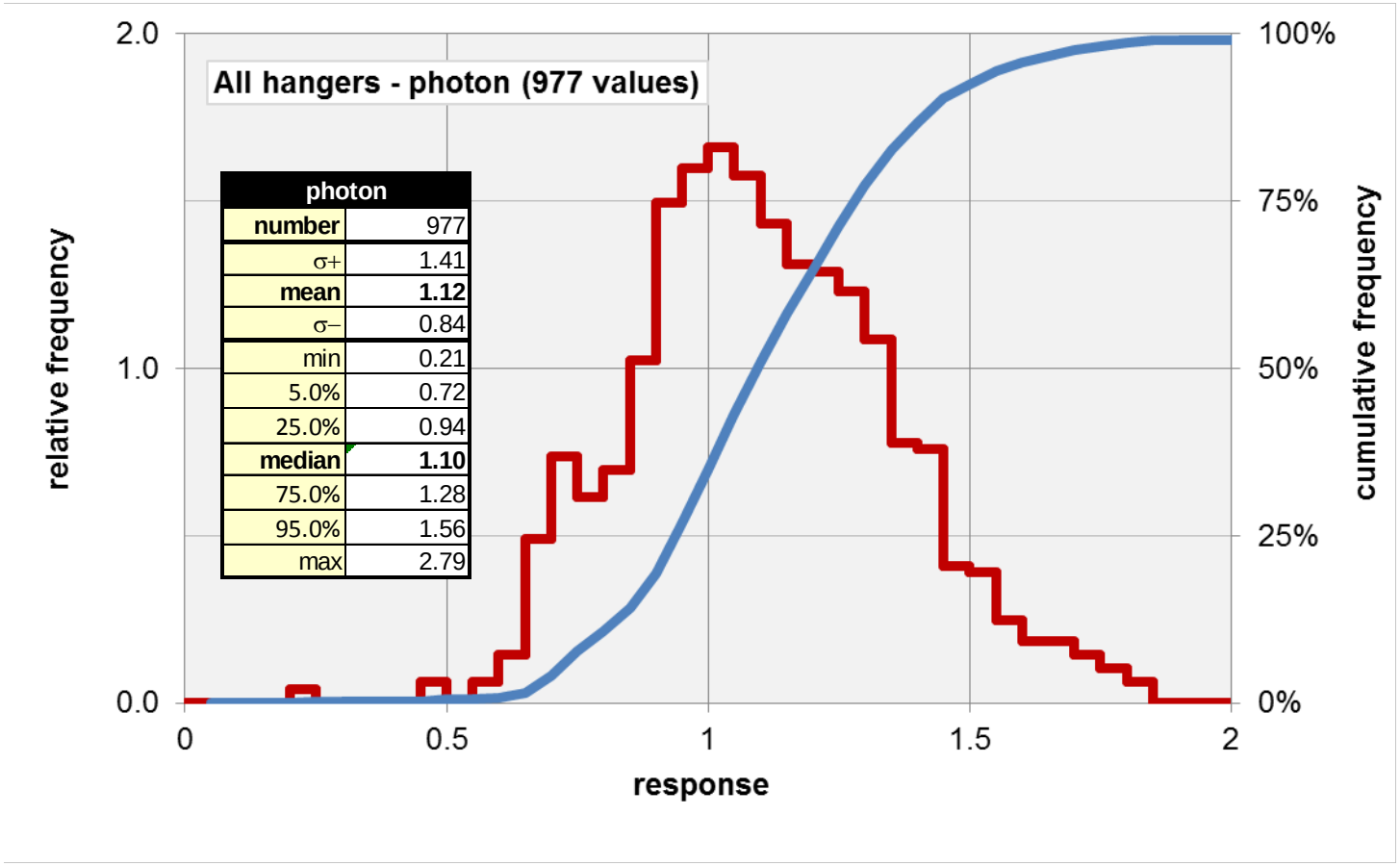
Trumpet curve



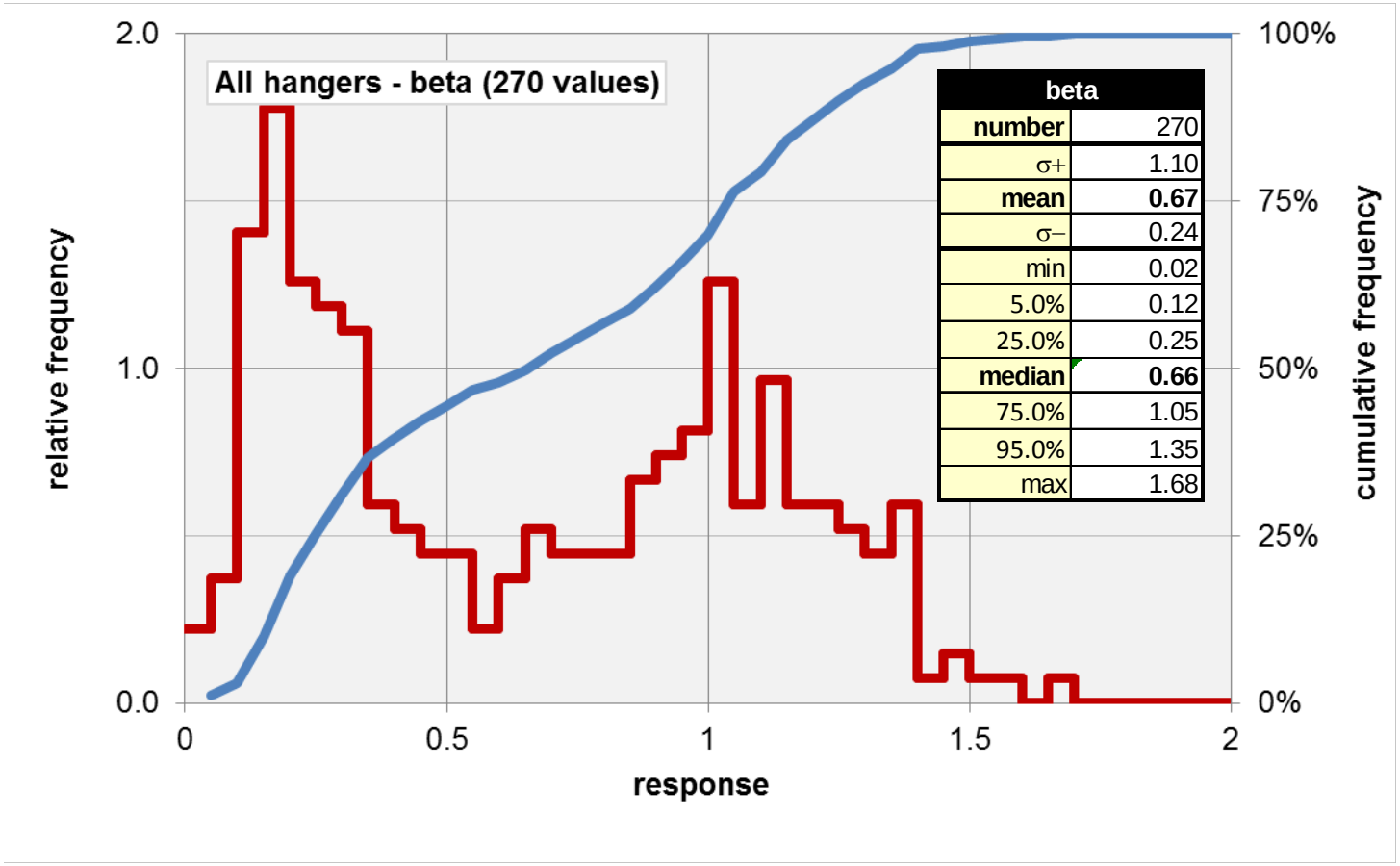
All response values



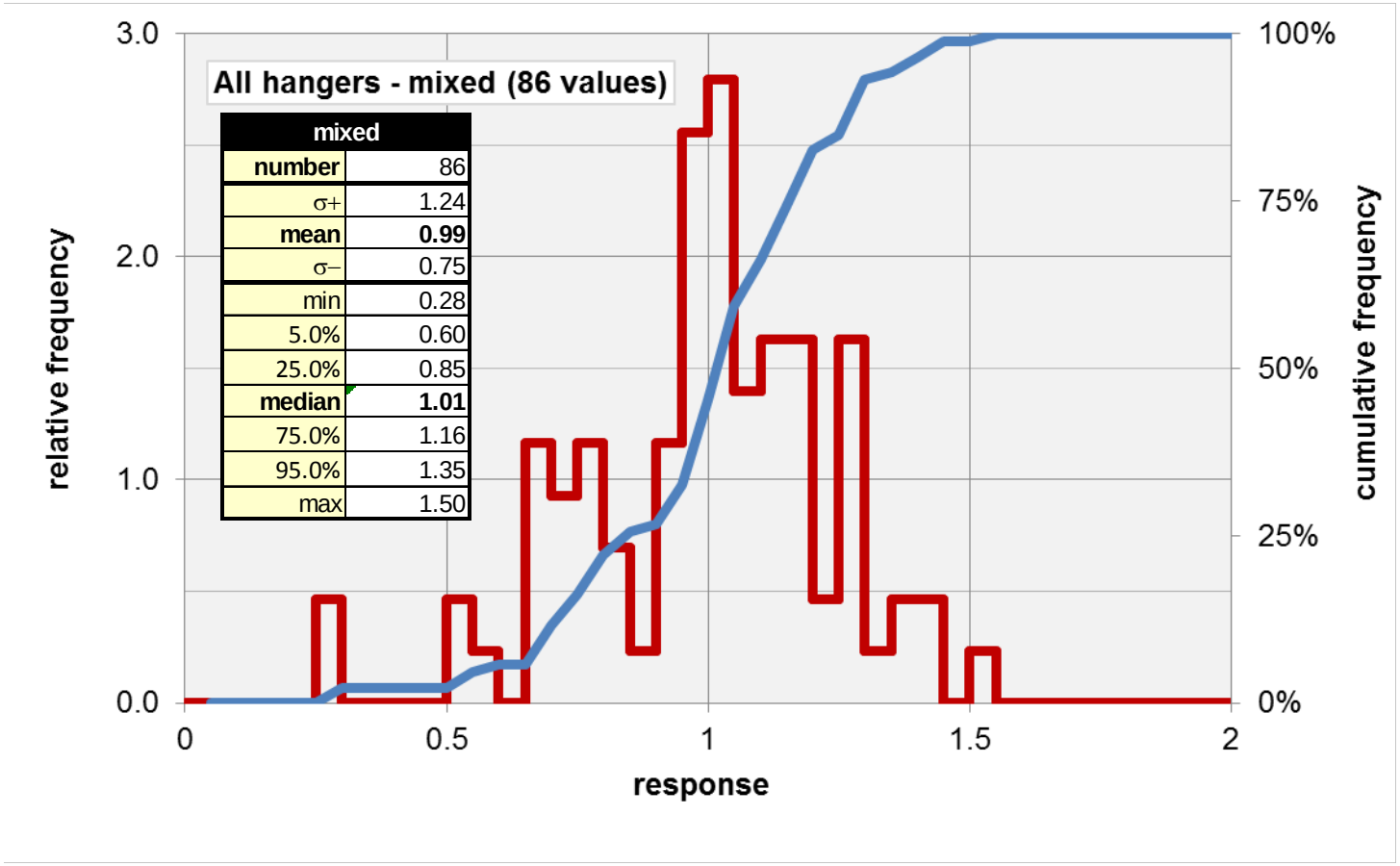
Photon response values



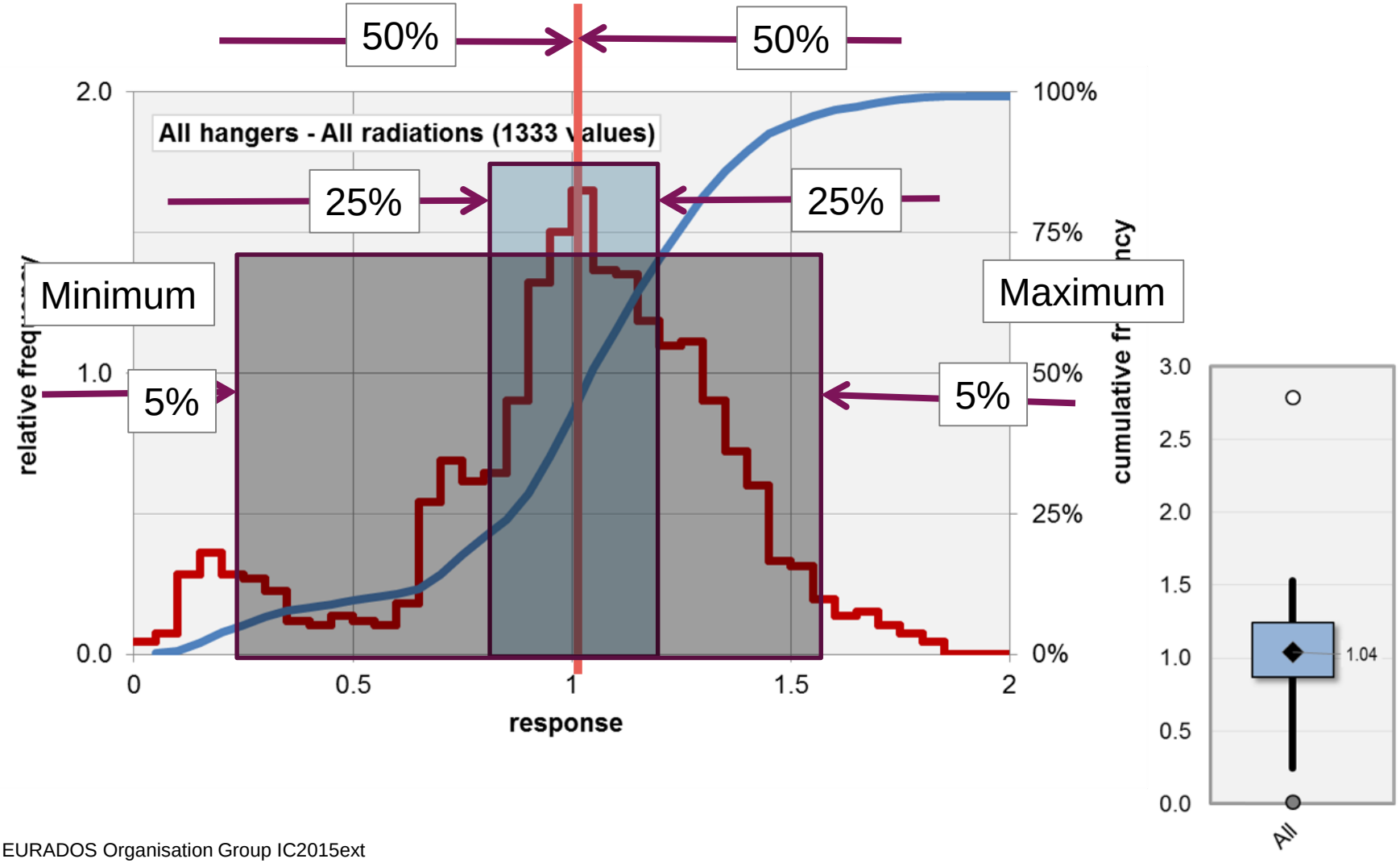
Beta response values



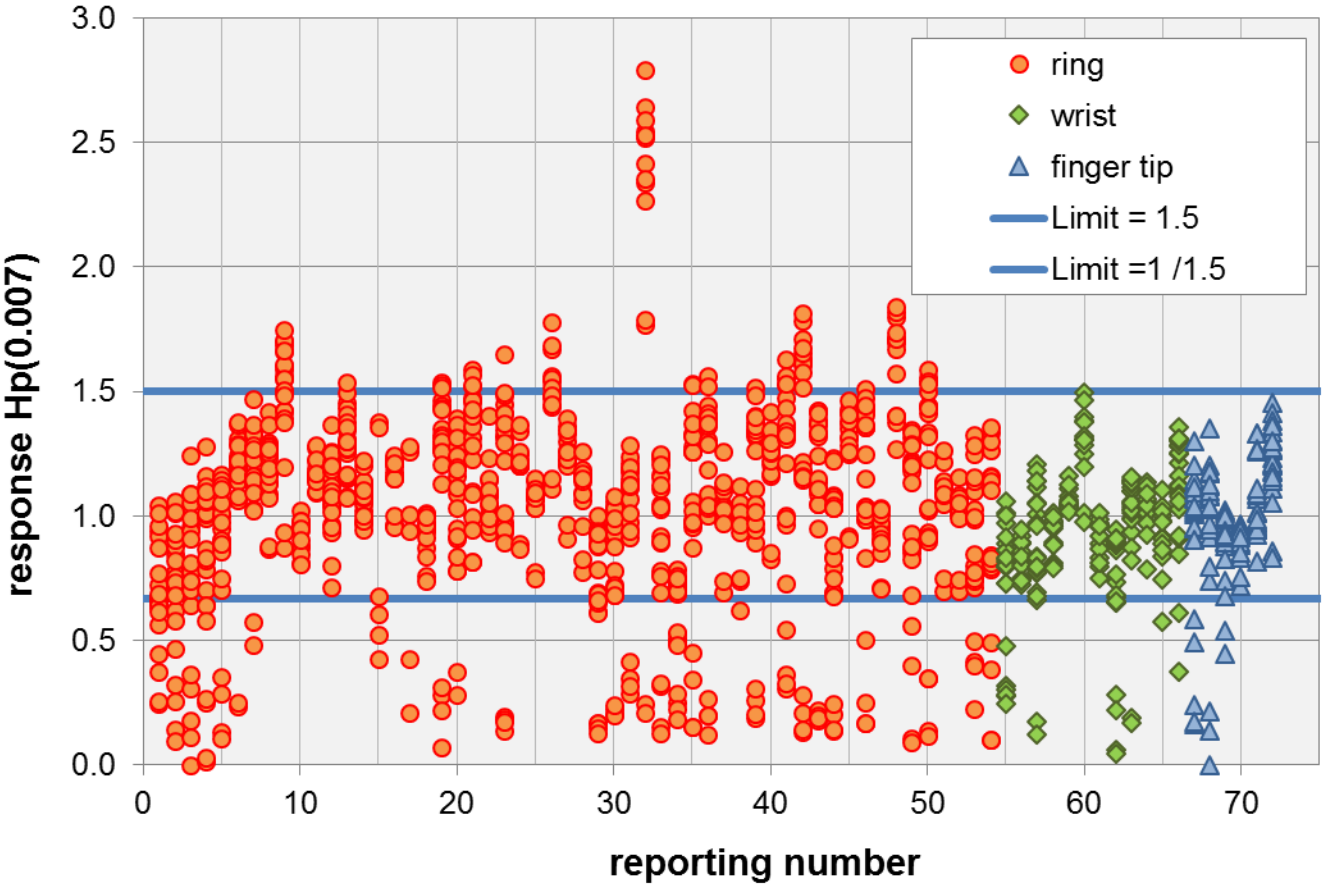
„Mixed“ response values



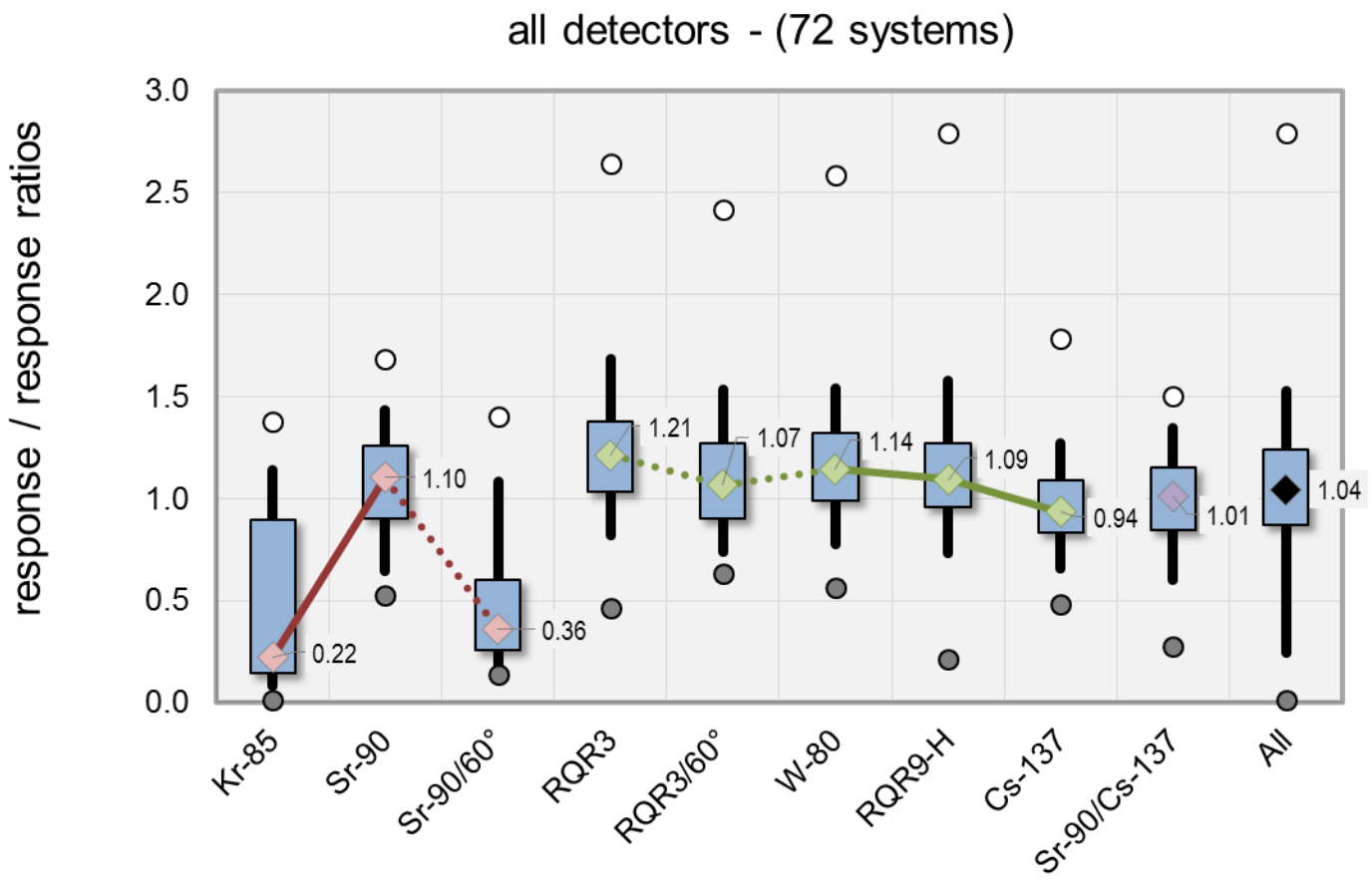
Frequency distribution of all Responses (R)



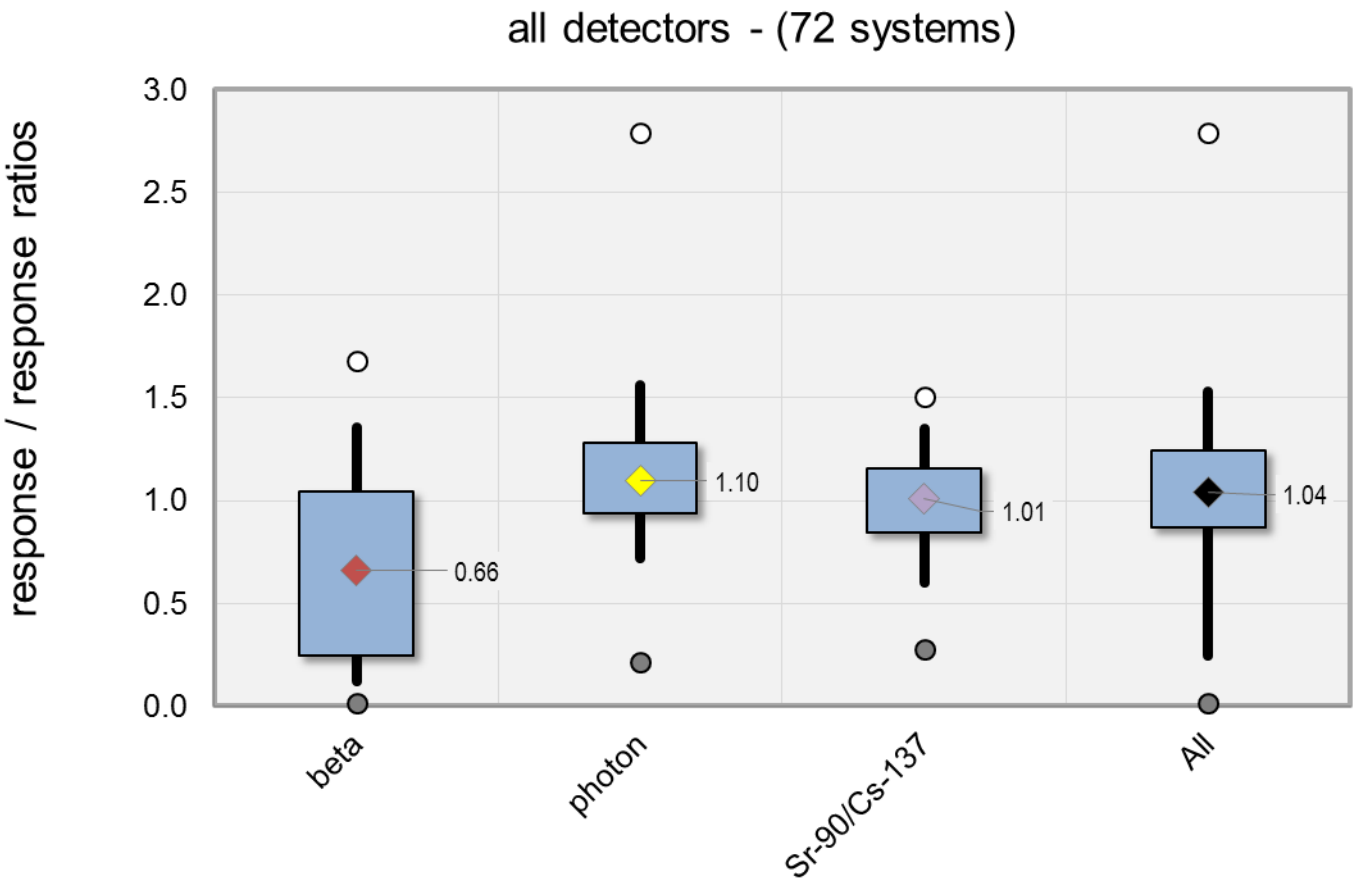
Individual results



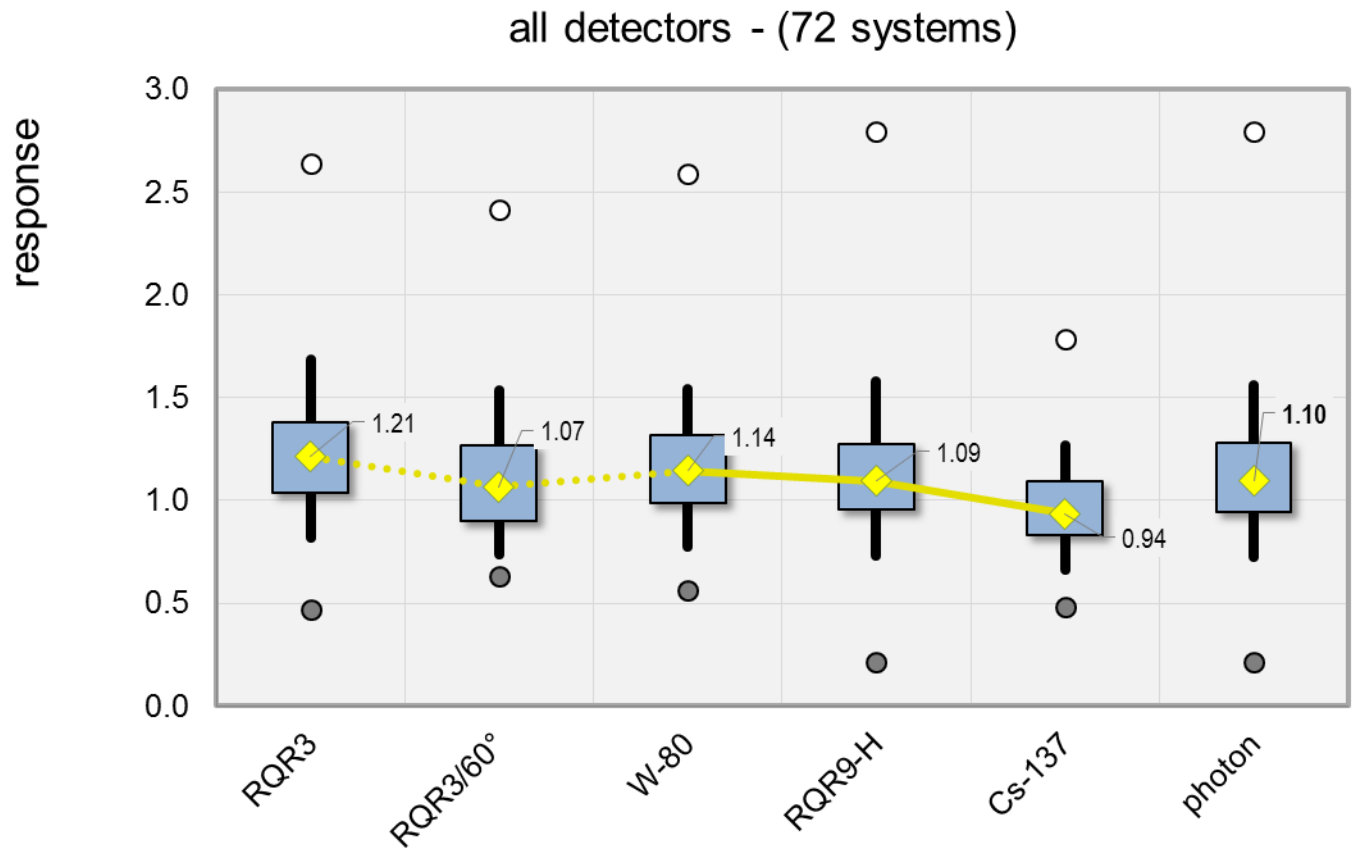
All response values



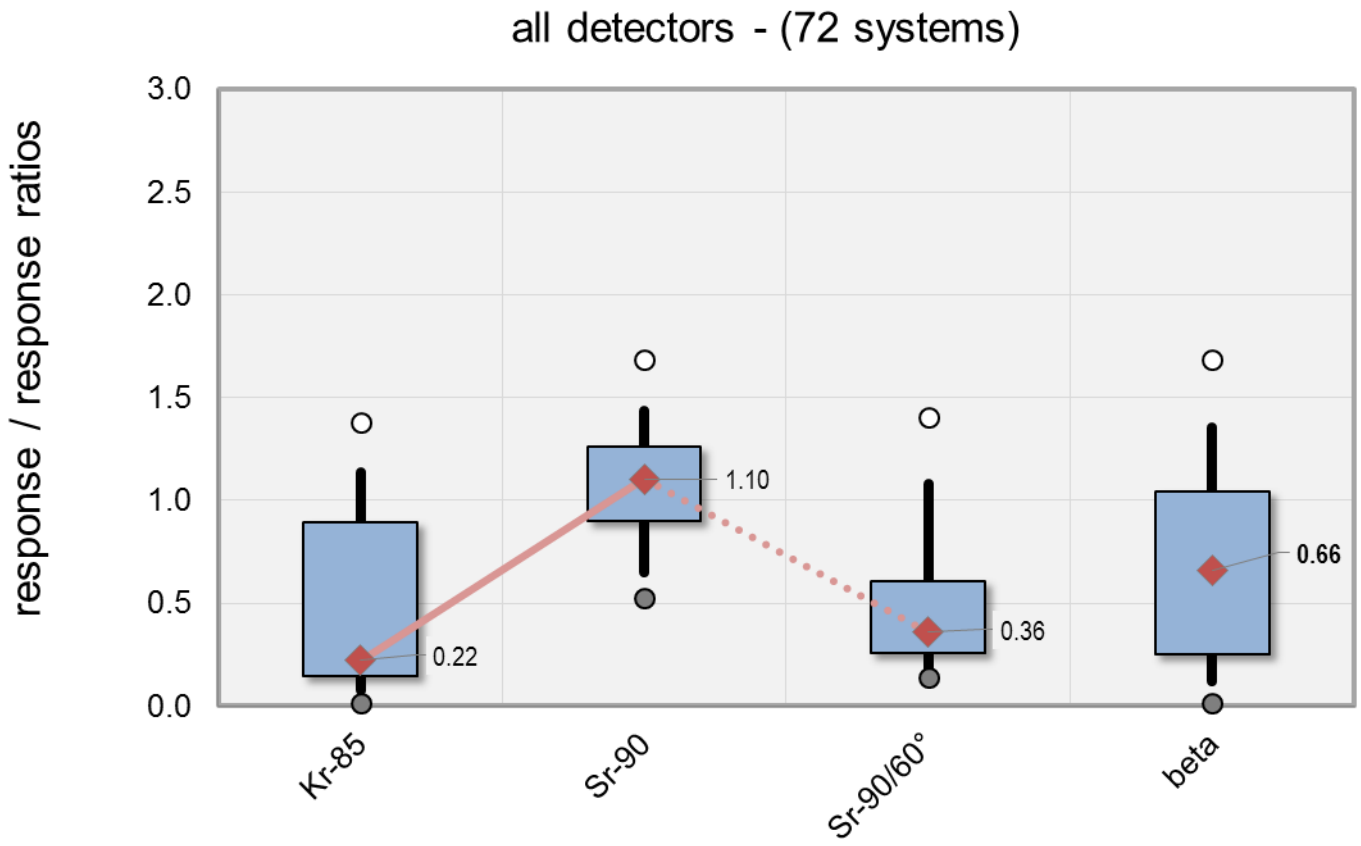
Response values distribution



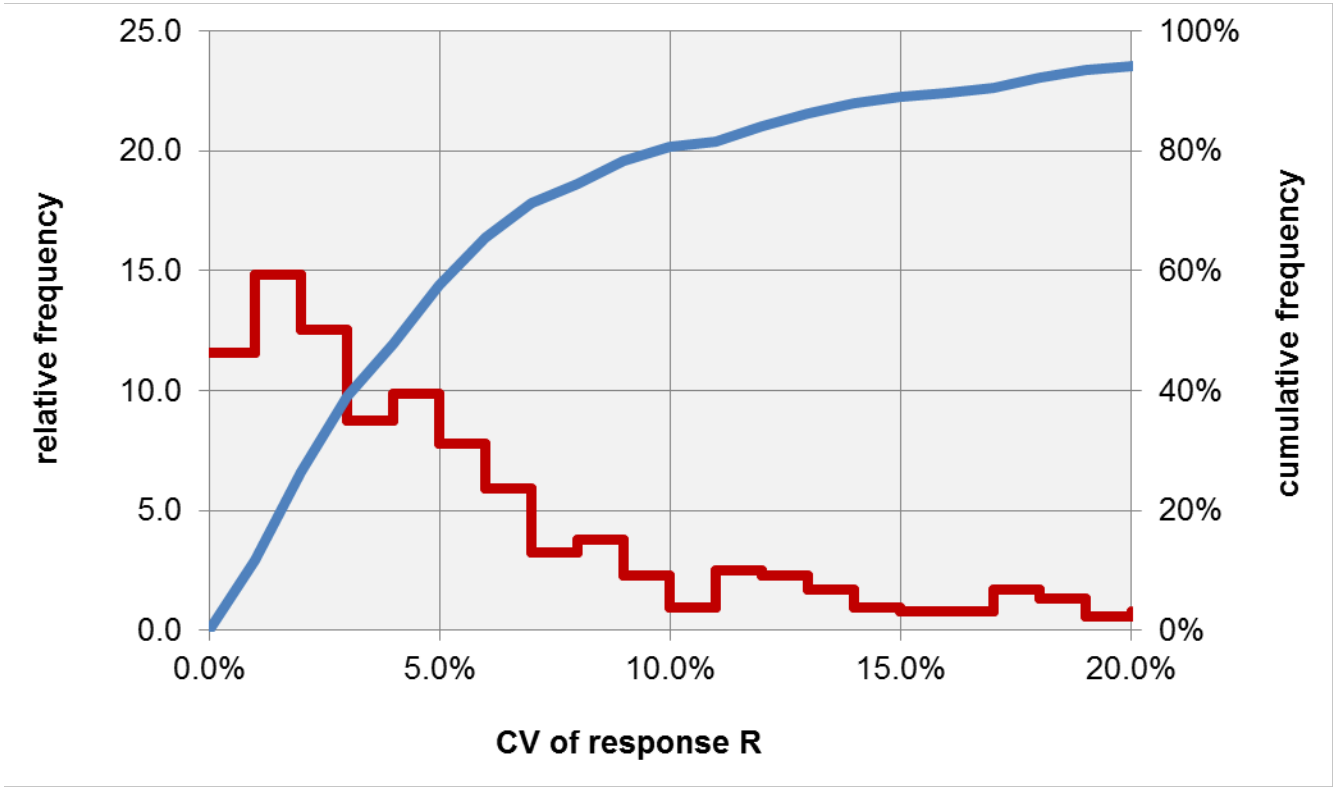
Photon radiations



Beta qualities

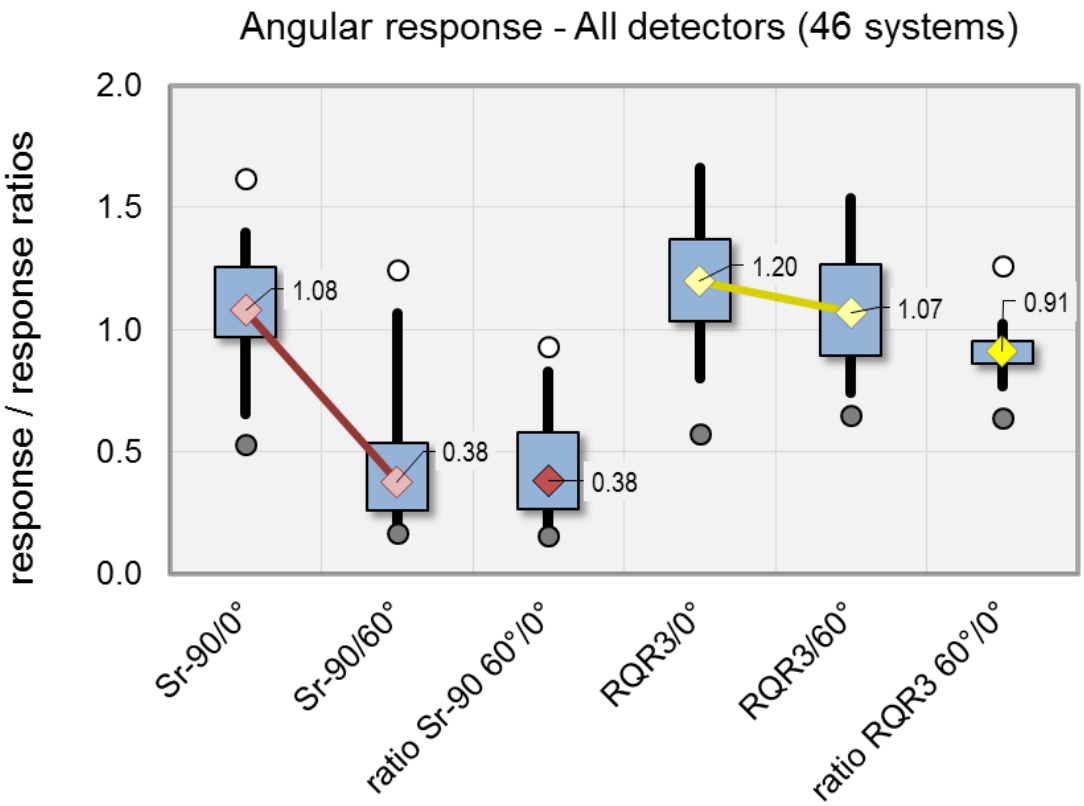


Coefficient of variation (CV) of response values R



All	
number	526
σ–	*15.6%*
mean	***6.8%***
σ+	*-2.0%*
min	0.0%
5.0%	0.6%
25.0%	1.9%
median	**4.2%**
75.0%	8.2%
95.0%	21.2%
max	97.5%

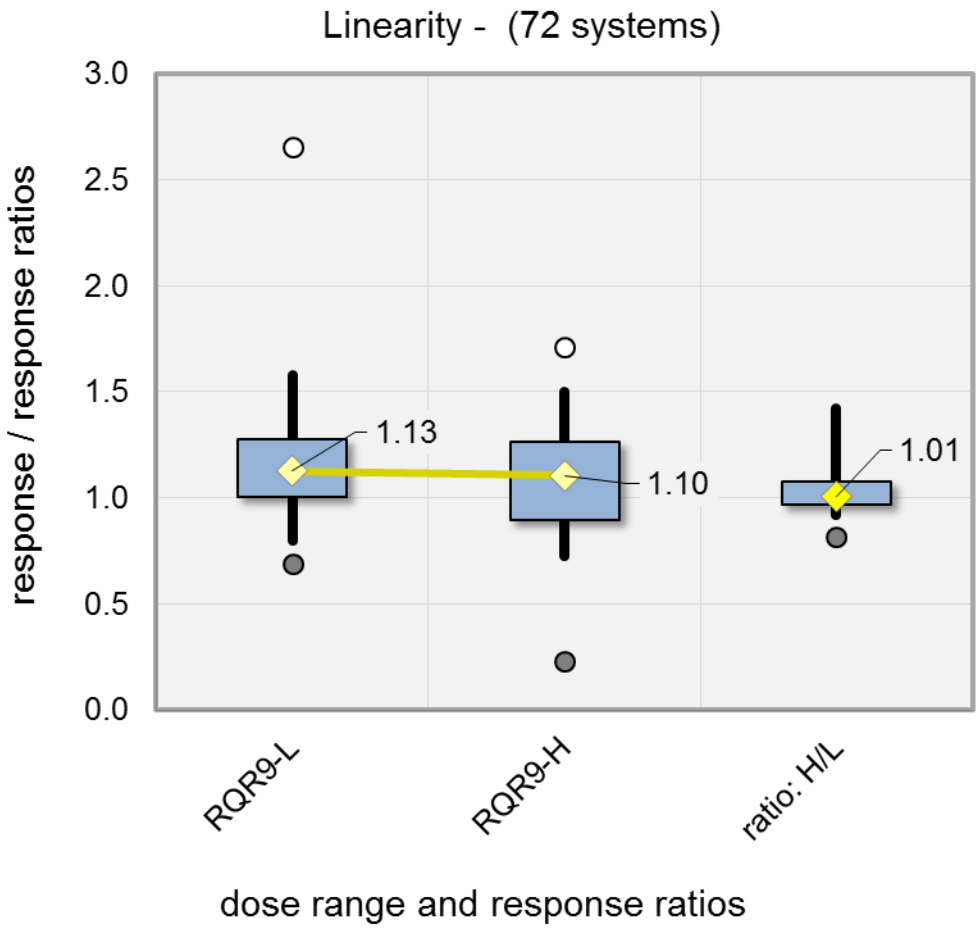
Angular response photon/beta



ratio Sr-90 60°/0°	
number	72
σ–	0.64
mean	**0.43**
σ+	0.22
min	0.16
5.0%	0.18
25.0%	0.26
median	**0.38**
75.0%	0.58
95.0%	0.83
max	0.93

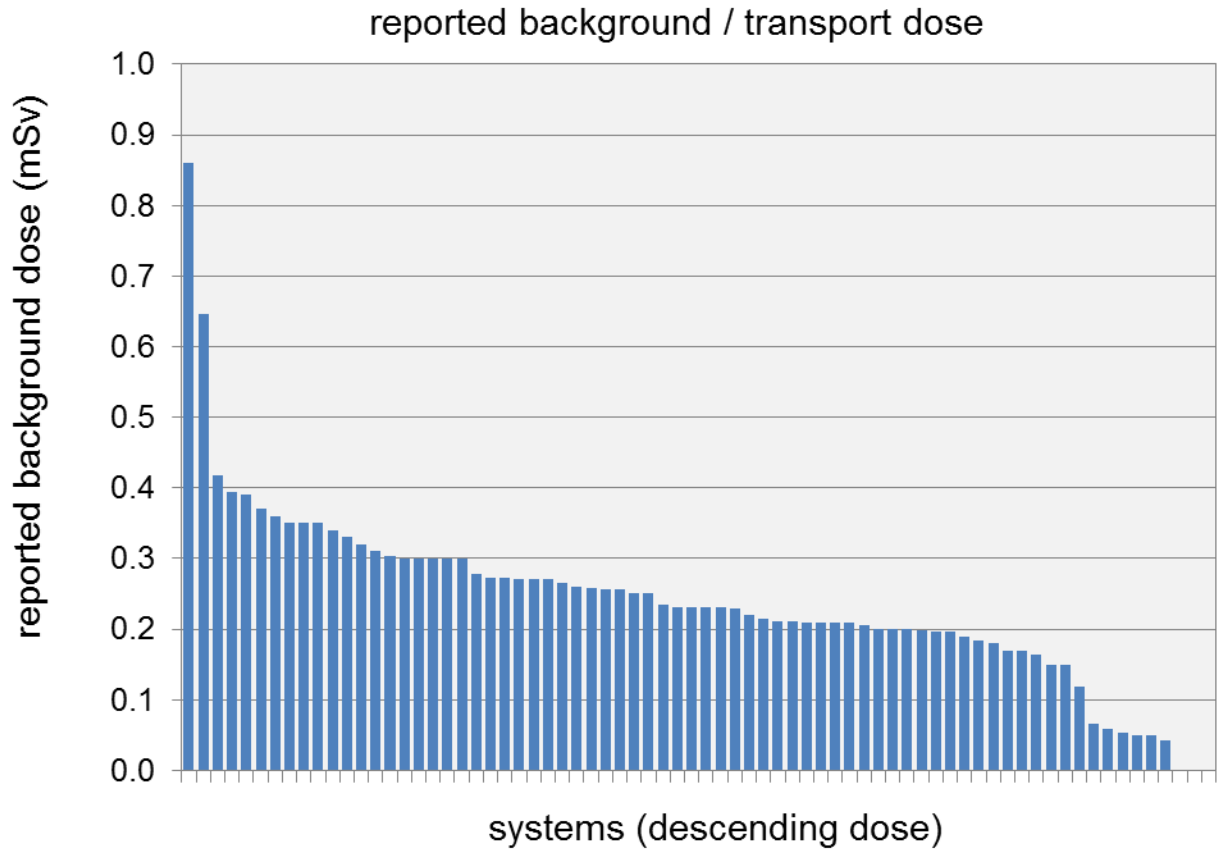
ratio RQR3 60°/0°	
number	72
σ–	1.00
mean	**0.90**
σ+	0.81
min	0.64
5.0%	0.77
25.0%	0.86
median	**0.91**
75.0%	0.95
95.0%	1.02
max	1.26

Linearity RQR9



ratio: H/L	
number	112
σ–	2.46
mean	**1.21**
σ+	-0.05
min	0.82
5.0%	0.92
25.0%	0.97
median	**1.01**
75.0%	1.08
95.0%	1.42
max	11.60

Reported background values



Dose mSv	
number	72
σ–	0.37
mean	**0.24**
σ+	0.11
min	0.00
5.0%	0.05
25.0%	0.19
median	**0.23**
75.0%	0.30
95.0%	0.39
max	0.86

3 systems with 0 mSv

Outliers (numbers and fractions)

SEIBERSDORF LABORATORIES

number of outliers					
Radiation	**Quality**	**Ph**	**PhB**	**B**	**All**
beta	Kr-85/0°		58	0	58
	Sr-90/0°		0	0	0
	Sr-90/60°		55	3	58
	all betas		**113**	**3**	**116**
photon	RQR3/0°	6	6		12
	RQR3/60°	5	2		7
	W-80/0°	5	8		13
	RQR9/0°	9	17		26
	Cs-137/0°	2	1		3
	all photons	**27**	**34**		**61**
mixed	Sr-90/Cs-137		2		2
all		**27**	**149**	**3**	**179**

Outliers (%)					
Radiation	**Quality**	**Ph**	**PhB**	**B**	**All**
beta	Kr-85/0°		67%	0%	64%
	Sr-90/0°		0%	0%	0%
	Sr-90/60°		64%	75%	64%
	all betas		**44%**	**25%**	**43%**
photon	RQR3/0°	11%	7%		9%
	RQR3/60°	9%	2%		5%
	W-80/0°	5%	5%		5%
	RQR9/0°	8%	10%		9%
	Cs-137/0°	4%	1%		2%
	all photons	**7%**	**6%**		**6%**
mixed	Sr-90/Cs-137		2%		**2%**
all		**7%**	**16%**	**25%**	**13%**

Number of outliers per system (approx. 1 out of 10)

SEIBERSDORF LABORATORIES

All systems														
# outliers (sys)	0	1	2	3	4	5	6	7	9	14	15	all	0-2	> 2
B	-	1	1	-	-	-	-	-	-	-	-	2	2	0
Ph	24	-	-	-	1	-	-	-	1	1	-	27	24	1
PhB	7	3	4	6	14	3	3	1	1	-	1	43	14	27
All	31	4	5	6	15	3	3	1	2	1	1	72	40	28
	40			32										
	56%			44%										

$$\frac{1}{F}\left(1-\frac{2H_0}{H_0+H_c}\right) \le R \le F\left(1+\frac{H_0}{2H_0+H_c}\right)$$

$F = 1.5 \qquad H_0 = 1.0\,mSv$

10% of outliers are accepted

Mean response of Ph only and B only systems

SEIBERSDORF LABORATORIES

mean response	Ph																											B	
reporting ID >	10	11	16	18	22	24	25	26	27	28	32	37	38	40	45	47	48	51	52	56	58	59	60	61	64	65	70	15	17
Kr-85																												0.64	0.97
Sr-90																												1.37	1.27
Sr-90/60°																												0.47	0.32
RQR3	1.00	1.28	1.20	0.99	1.09	1.35	1.15	1.73	1.37	1.18	2.59	1.20	1.07	1.38	1.42	1.03	1.81	1.24	1.11	0.82	0.97	1.14	1.38	0.97	1.10	1.01	0.95		
RQR3/60°	0.89	1.18	0.96	0.93	1.24	1.23	1.10	1.57	1.24	1.05	2.39	1.07	0.84	1.22	1.42	0.88	1.79	1.13	1.06	0.74	0.84	1.05	1.30	0.80	0.85	0.87	0.89		
W-80	0.97	1.16	1.22	0.95	1.01	1.21	1.04	1.50	1.27	1.14	2.43	1.03	1.04	1.24	1.32	0.92	1.51	1.09	1.03	0.88	0.99	1.07	1.40	0.98	1.05	0.93	0.94		
RQR9-H	0.81	1.16	1.18	0.75	1.10	1.21	1.08	1.50	1.26	1.14	0.23	1.01	1.02	1.28	1.35	0.98	1.71	1.11	1.06	0.82	0.81	1.04	0.99	0.79	0.97	1.02	0.74		
RQR9-L	0.95	1.20	1.16	1.00	1.19	1.23	1.09	1.52	1.27	1.16	2.66	1.02	0.99	1.22	1.30	0.96	1.71	1.10	1.02	0.74	0.96	1.05	1.35	0.94	1.01	0.97	0.94		
Cs-137	0.86	1.10	0.98	0.85	0.99	0.88	0.76	1.13	0.94	0.80	1.78	0.71	0.68	0.84	0.92	0.71	1.32	0.72	0.72	0.93	0.88	1.03	1.22	0.88	1.13	0.66	0.84		
Sr-90/Cs-137																													
All	0.92	1.18	1.13	0.92	1.09	1.19	1.04	1.49	1.23	1.08	2.07	1.01	0.95	1.20	1.29	0.92	1.62	1.07	1.00	0.83	0.92	1.06	1.29	0.91	1.02	0.91	0.89	0.83	0.85
outliers	-	-	-	-	-	-	-	4	-	-	14	-	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	1	2
Sr 60°/0°	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.35	0.25
RQR3 60°/0°	0.89	0.92	0.80	0.94	1.13	0.91	0.96	0.91	0.90	0.89	0.92	0.90	0.78	0.88	1.00	0.86	0.99	0.92	0.96	0.90	0.87	0.92	0.94	0.83	0.78	0.86	0.93	-	-
RQR3 H/L	0.85	0.97	1.02	0.75	0.92	0.98	0.99	0.99	1.00	0.98	0.09	0.99	1.04	1.05	1.03	1.02	1.00	1.01	1.04	1.12	0.84	0.99	0.74	0.84	0.96	1.05	0.79	-	-

Mean response of PhB systems

SEIBERSDORF LABORATORIES

mean response	PhB																								
reporting ID >	1	2	3	4	5	6	7	8	9	12	13	14	19	20	21	23	29	30	31	33	34	35	36	39	41
Kr-85	0.25	0.12	0.15	0.02	0.12	1.10	1.03	1.11	1.29	1.00	1.20	1.11	0.14	0.33	0.97	0.17	0.14	0.20	0.38	0.14	0.20	0.15	0.16	0.20	0.32
Sr-90	0.98	0.98	1.10	0.64	1.00	1.37	1.40	1.26	1.62	1.31	1.40	1.21	1.24	1.36	1.49	0.93	0.65	0.75	1.17	0.90	0.53	0.97	1.04	1.08	1.03
Sr-90/60°	0.41	0.29	0.34	0.26	0.32	0.25	0.53	0.87	0.90	0.76	1.08	0.96	0.30	0.93	1.25	0.18	0.17	0.23	0.30	0.32	0.27	0.40	0.23	0.28	0.45
RQR3	0.70	0.58	0.39	1.08	1.10	1.30	1.35	1.35	1.58	1.11	1.37	1.13	1.47	1.29	1.47	1.57	0.98	1.07	1.17	1.25	0.77	1.53	1.46	1.50	1.52
RQR3/60°	0.65	0.73	0.73	1.08	0.83	1.20	1.13	1.33	1.49	1.10	1.31	1.01	1.45	0.91	1.34	1.37	0.84	0.94	0.93	0.97	0.75	1.27	1.35	1.30	1.45
W-80	0.63	0.74	0.76	1.10	1.04	1.22	1.22	1.23	1.71	1.12	1.37	1.10	1.41	1.24	1.48	1.37	0.91	0.98	1.20	1.13	0.71	1.36	1.38	1.35	1.37
RQR9-H	0.66	0.63	0.84	0.80	0.80	1.20	1.23	1.29	1.60	1.20	1.42	0.98	1.28	0.78	0.82	1.35	0.94	1.03	1.15	1.19	0.72	1.26	1.34	1.40	1.28
RQR9-L	0.71	0.85	0.79	1.07	1.09	1.22	1.13	1.20	1.60	1.13	1.16	1.06	1.24	1.31	1.49	1.35	0.93	0.98	1.12	1.09	0.69	1.20	1.40	1.33	1.53
Cs-137	0.92	0.97	1.07	0.85	0.89	1.12	1.15	1.11	1.41	0.95	1.23	1.07	1.35	1.05	1.16	0.94	0.64	0.70	0.96	0.73	0.49	0.92	1.07	0.92	1.09
Sr-90/Cs-137	0.98	0.89	1.04	0.64	1.03	1.26	1.21	1.22	1.46	1.16	1.32	1.11	1.31	1.17	1.35	0.99	0.67	0.69	1.04	0.77	0.50	1.00	1.01	0.99	1.17
All	0.68	0.68	0.72	0.79	0.84	1.13	1.14	1.20	1.49	1.09	1.29	1.08	1.15	1.06	1.30	1.05	0.70	0.78	0.97	0.87	0.58	1.04	1.08	1.06	1.14
outliers	7	6	5	4	4	2	1	-	9	-	1	-	4	2	-	5	4	4	4	4	4	4	4	4	5
Sr 60°/0°	0.42	0.30	0.31	0.40	0.32	0.18	0.38	0.69	0.56	0.58	0.77	0.79	0.24	0.69	0.83	0.19	0.26	0.31	0.26	0.36	0.51	0.41	0.22	0.26	0.44
RQR3 60°/0°	0.92	1.26	1.88	1.01	0.75	0.92	0.84	0.98	0.94	0.99	0.96	0.89	0.99	0.71	0.91	0.87	0.86	0.88	0.79	0.78	0.97	0.83	0.93	0.87	0.96
RQR3 H/L	0.93	0.75	1.06	0.75	0.74	0.98	1.09	1.07	1.00	1.06	1.22	0.92	1.04	0.60	0.55	1.00	1.01	1.05	1.03	1.10	1.05	1.05	0.96	1.05	0.83

mean response	PhB																		
reporting ID >	42	43	44	46	49	50	53	54	55	57	62	63	66	67	68	69	71	72	
Kr-85	0.14	0.19	0.14	0.17	0.10	0.13	0.31	0.10	0.28	0.15	0.05	0.99	0.97	0.17	0.77	0.49	0.88	0.84	
Sr-90	1.19	1.08	0.83	1.04	0.78	0.98	0.77	0.80	1.01	1.17	0.67	1.15	1.27	1.13	1.14	1.00	1.12	1.25	
Sr-90/60°	0.25	0.20	0.22	0.38	0.48	0.35	0.46	0.44	0.39	0.73	0.25	0.18	0.49	0.54	0.18	0.71	1.04	1.14	
RQR3	1.75	1.41	1.23	1.30	1.31	1.43	1.30	1.34	0.89	1.01	0.92	1.10	1.28	1.05	1.10	1.00	1.03	1.24	
RQR3/60°	1.62	1.14	0.78	0.99	1.24	1.48	1.12	1.28	0.79	0.87	0.90	0.85	1.07	0.91	0.93	0.94	1.11	1.22	
W-80	1.62	1.37	1.06	1.46	1.18	1.35	1.10	1.14	0.84	0.85	0.87	1.04	1.27	1.02	1.23	0.94	1.24	1.36	
RQR9-H	1.71	1.28	1.05	1.39	1.27	1.50	0.94	1.14	0.77	0.73	0.88	0.99	1.19	1.13	1.13	0.90	1.07	1.33	
RQR9-L	1.60	1.39	1.04	1.40	1.27	1.56	1.00	1.15	0.80	1.10	0.88	1.02	1.29	0.64	1.15	0.92	1.02	1.34	
Cs-137	1.15	1.10	0.69	1.01	0.90	0.96	0.76	0.81	1.01	0.88	0.65	1.14	0.88	1.08	0.52	0.85	0.95	1.10	
Sr-90/Cs-137	1.17	1.00	0.77	0.99	0.84	0.92	0.74	0.84	0.28	1.03	0.70	1.13	1.11	1.16	1.00	0.95	0.99	1.16	
All	1.26	1.05	0.81	1.05	0.96	1.09	0.87	0.93	0.72	0.85	0.70	0.97	1.10	0.90	0.94	0.88	1.06	1.21	
outliers	15	4	4	3	3	6	3	3	6	2	4	2	1	3	3	-	-	-	
Sr 60°/0°	0.21	0.19	0.27	0.36	0.61	0.36	0.59	0.54	0.39	0.62	0.38	0.16	0.39	0.47	0.16	0.71	0.93	0.91	
RQR3 60°/0°	0.93	0.81	0.64	0.76	0.95	1.04	0.86	0.95	0.89	0.86	0.97	0.77	0.83	0.86	0.84	0.93	1.08	0.99	
RQR3 H/L	1.07	0.92	1.01	1.00	1.01	0.96	0.94	0.99	0.97	0.67	1.00	0.97	0.92	1.77	0.98	0.98	1.05	0.99	

Certificates of perticipation

SEIBERSDORF LABORATORIES

EURADOS European Radiation Dosimetry Group

Extremity dosemeter intercomparison IC2015ext

Certificate of Participation

for the EURADOS Intercomparison 2015 for extremity dosemeters (IC2015ext)

Certificate Number: EURADOS-IC2015ext-[redacted]

Number of pages: 3

Date of Issue: January 18th, 2016

Participating Institute: [redacted]

Dosimetry System: [redacted]

Reporting number: 44 (this anonymous number will be used in further publications)

Intercomparison procedure: The EURADOS Intercomparison 2015 for extremity dosemeters was managed and coordinated on behalf of EURADOS by the WG2 Intercomparison Organization Group (OG). The OG established the irradiation plan and announced the intercomparison, including the range limits of the doses and radiation qualities, in April 2015.

Participants were asked to indicate details of the dosemeter reference point on the online application form. After completing application procedures the participants sent their dosemeters, according to the instructions, to the OG coordinator (June 2015). The coordinator checked the correct labelling of the dosemeters and transferred all dosemeters, along with the instructions, to the irradiation laboratory. The laboratory irradiated the dosemeters according to the irradiation plan and sent all the dosemeters back to the coordinator (October 2015).

The Coordinator then returned the dosemeters to the participants for assessment and indicated which dosemeters were not irradiated. The participants were instructed to follow normal routine procedures as far as possible. The participants then sent the results of the dosemeter readings to the coordinator (November 2015). After receipt of the participants' results, the coordinator sent the irradiation data to the participants.

Number of participants: 52 institutes participated in IC2015ext with a total of 72 systems.

Coordinator: H. Stadtmann, Ch. Gärtner (Seibersdorf Labor GmbH, A-2444 Seibersdorf)

Intercomparison results: See the table on pages 2 and 3 of this certificate.

Irradiation data: See the attached certificate of the irradiation laboratory: 3320674.S050-2015.

Participant results: See the attached signed dose report provided by the participant.

On behalf of the intercomparison Organization Group:

Hannes Stadtmann
Coordinator

On behalf of EURADOS:

Werner Rühm
Chairperson

EURADOS European Radiation Dosimetry Group

Extremity dosemeter intercomparison IC2015ext

Result of the Intercomparison (Dosimetry System [redacted])

EURADOS Dosemeter ID	Participant's Dosemeter ID	Radiation Quality	Quantity	Participant's Value	Reference Value	Response
S050/2015–06	17508	RQR3	$H_p(0.07)$	19.98 mSv	16.21 mSv	1.233
S050/2015–25	17923	RQR3	$H_p(0.07)$	19.80 mSv	16.21 mSv	1.221
S050/2015–20	12307	RQR3/60°	$H_p(0.07)$	10.96 mSv	16.13 mSv	0.679
S050/2015–22	18560	RQR3/60°	$H_p(0.07)$	14.27 mSv	16.13 mSv	0.885
S050/2015–27	12037	RQR9	$H_p(0.07)$	20.72 mSv	19.92 mSv	1.040
S050/2015–30	14308	RQR9	$H_p(0.07)$	20.58 mSv	19.92 mSv	1.033
S050/2015–13	18038	RQR9	$H_p(0.07)$	570.83 mSv	550.76 mSv	1.036
S050/2015–18	17916	RQR9	$H_p(0.07)$	587.76 mSv	550.76 mSv	1.067
S050/2015–01	18901	S-Cs	$H_p(0.07)$	3.72 mSv	5.37 mSv	0.693
S050/2015–08	17946	S-Cs	$H_p(0.07)$	3.73 mSv	5.37 mSv	0.695
S050/2015–02	12626	W-80	$H_p(0.07)$	25.33 mSv	24.38 mSv	1.039
S050/2015–12	10864	W-80	$H_p(0.07)$	26.46 mSv	24.38 mSv	1.085
S050/2015–14	17059	W-80	$H_p(0.07)$	26.28 mSv	24.38 mSv	1.078
S050/2015–26	14678	W-80	$H_p(0.07)$	25.13 mSv	24.38 mSv	1.031
S050/2015–11	15003	Sr-90/S-Cs	$H_p(0.07)$	5.86 mSv	7.40 mSv	0.792
S050/2015–28	18572	Sr-90/S-Cs	$H_p(0.07)$	5.53 mSv	7.40 mSv	0.747
S050/2015–07	18663	Kr-85	$H_p(0.07)$	0.77 mSv	5.51 mSv	0.140
S050/2015–24	14689	Kr-85	$H_p(0.07)$	0.80 mSv	5.51 mSv	0.145
S050/2015–16	18166	Sr-90	$H_p(0.07)$	6.42 mSv	7.69 mSv	0.835
S050/2015–19	17892	Sr-90	$H_p(0.07)$	6.41 mSv	7.69 mSv	0.834
S050/2015–05	10633	Sr-90/60°	$H_p(0.07)$	1.76 mSv	8.65 mSv	0.203
S050/2015–23	14319	Sr-90/60°	$H_p(0.07)$	2.13 mSv	8.65 mSv	0.246

Radiation qualities and average photon energies or maximum beta energies (according to certificate of irradiation):

- Beta Radiation:
  - Kr-85: 0.69 MeV (Emax) (ISO 6980)
  - Sr-90/Y-90: 2.3 MeV (Emax) (ISO 6980)
- Gamma Radiation:
  - S-Cs: 662 keV (ISO 4037)
- X-Rays:
  - W-80: 57 keV (80 kV) (ISO 4037)
  - RQR 3: 33 keV (50 kV) (IEC 61267)
  - RQR 9: 57 keV (120 kV) (IEC 61267)

EURADOS European Radiation Dosimetry Group

Extremity dosemeter intercomparison IC2015ext

Result of the Intercomparison (Dosimetry System [redacted])

EURADOS Dosemeter ID	Participant's Dosemeter ID	Radiation Quality
S050/2015–03	18699	not irradiated
S050/2015–04	13130	not irradiated
S050/2015–09	17003	not irradiated
S050/2015–10	18561	not irradiated
S050/2015–15	18913	not irradiated
S050/2015–17	18590	not irradiated
S050/2015–21	17317	not irradiated
S050/2015–29	13834	not irradiated

EURADOS Organisation Group IC2015ext

Additional certificates (report)

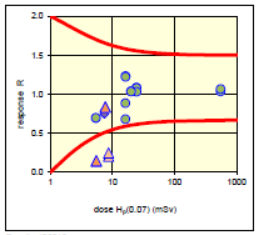
SEIBERSDORF LABORATORIES

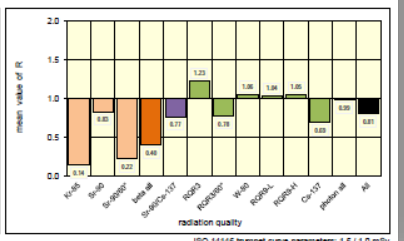
Reporting number 44 : photon/beta dosemeter

radiation type	radiation quality	true values reported by the irradiating laboratory: dosemeter number	true values reported by the irradiating laboratory: dose $H_p(0.07)$ mSv	values reported by participant: dose $H_p(0.07)$ mSv	results: response R (reported/true)	
beta	Kr-85	7	5.51	0.77	0.140	outlier
		24	5.51	0.8	0.145	outlier
	Sr-90	16	7.69	6.42	0.835	OK
		19	7.69	6.41	0.834	OK
	Sr-90/60°	5	8.65	1.76	0.203	outlier
		23	8.65	2.13	0.246	outlier
mixed	Sr-90/Cs-137	11	7.40	5.86	0.792	OK
		28	7.40	5.53	0.747	OK
photon	RQR3	6	16.21	19.98	1.233	OK
		25	16.21	19.8	1.221	OK
	RQR3/60°	20	16.13	10.96	0.679	OK
		22	16.13	14.27	0.885	OK
	W-80	2	24.38	25.33	1.039	OK
		12	24.38	26.46	1.085	OK
		14	24.38	26.28	1.078	OK
		26	24.38	25.13	1.031	OK
	RQR9-L	27	19.92	20.72	1.040	OK
		30	19.92	20.58	1.033	OK
	RQR9-H	13	550.76	570.83	1.036	OK
		18	550.76	587.76	1.067	OK
	Cs-137	1	5.37	3.72	0.693	OK
		8	5.37	3.73	0.695	OK
	NIR	3		0.17		
	NIR	4		0.17		
	NIR	9		0.15		
	NIR	10		0.16		
	NIR	15		0.17		
	NIR	17		0.16		
	NIR	21		0.16		
	NIR	29		0.17		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85	2	0.14	0.14	0.15	0.14	2%
Sr-90	2	0.83	0.83	0.84	0.83	0%
Sr-90/60°	2	0.22	0.22	0.25	0.20	14%
beta all	6	0.22	0.40	0.84	0.14	85%
Sr-90/Cs-137	2	0.77	0.77	0.79	0.75	4%
RQR3	2	1.23	1.23	1.23	1.22	1%
RQR3/60°	2	0.78	0.78	0.89	0.68	19%
W-80	4	1.06	1.06	1.09	1.03	3%
RQR9-L	2	1.04	1.04	1.04	1.03	0%
RQR9-H	2	1.05	1.05	1.07	1.04	2%
Cs-137	2	0.69	0.69	0.70	0.69	0%
photon all	14	1.04	0.99	1.23	0.68	18%
All	22	0.86	0.81	1.23	0.14	42%

outliers: 4 of 22 **fraction of outliers: 18%**





Results: $IC2015_{ext}$ ISO 14146 trumpet curve parameters: 1.5 / 1.0 mSv

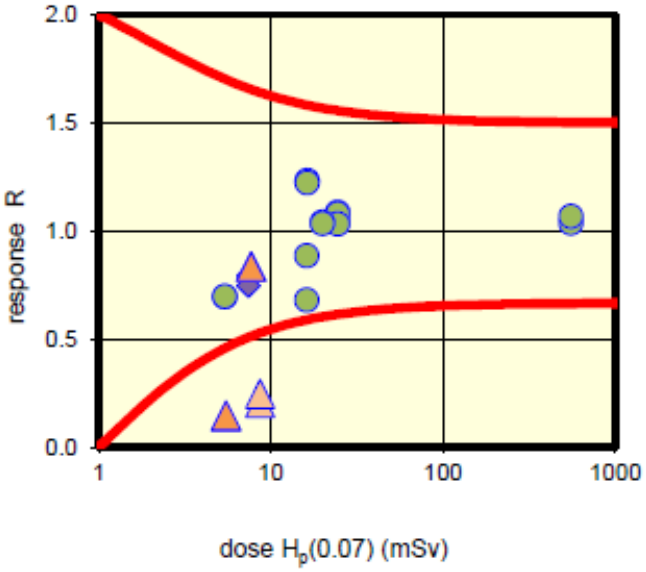
SEIBERSDORF LABORATORIES

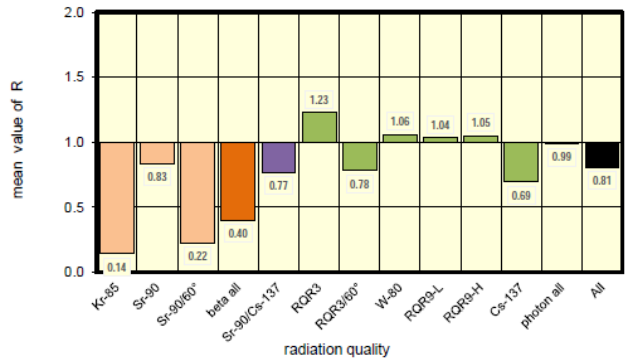
Reporting number 44 : photon/beta dosemeter

	true values reported by the irradiating laboratory			values reported by participant	results	
radiation type	radiation quality	dosemeter number	dose $H_p(0.07)$ mSv	dose $H_p(0.07)$ mSv	response R (reported/true)	
beta	Kr-85	7	5.51	0.77	0.140	outlier
		24	5.51	0.8	0.145	outlier
	Sr-90	16	7.69	6.42	0.835	OK
		19	7.69	6.41	0.834	OK
	Sr-90/60°	5	8.65	1.76	0.203	outlier
		23	8.65	2.13	0.246	outlier
mixed	Sr-90/Cs-137	11	7.40	5.86	0.792	OK
		28	7.40	5.53	0.747	OK
photon	RQR3	6	16.21	19.98	1.233	OK
		25	16.21	19.8	1.221	OK
	RQR3/60°	20	16.13	10.96	0.679	OK
		22	16.13	14.27	0.885	OK
	W-80	2	24.38	25.33	1.039	OK
		12	24.38	26.46	1.085	OK
		14	24.38	26.28	1.078	OK
		26	24.38	25.13	1.031	OK
	RQR9-L	27	19.92	20.72	1.040	OK
		30	19.92	20.58	1.033	OK
	RQR9-H	13	550.76	570.83	1.036	OK
		18	550.76	587.76	1.067	OK
	Cs-137	1	5.37	3.72	0.693	OK
		8	5.37	3.73	0.695	OK
	NIR	3		0.17		
	NIR	4		0.17		
	NIR	9		0.15		
	NIR	10		0.16		
	NIR	15		0.17		
	NIR	17		0.16		
	NIR	21		0.16		
	NIR	29		0.17		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85	2	0.14	0.14	0.15	0.14	2%
Sr-90	2	0.83	0.83	0.84	0.83	0%
Sr-90/60°	2	0.22	0.22	0.25	0.20	14%
beta all	6	0.22	0.40	0.84	0.14	85%
Sr-90/Cs-137	2	0.77	0.77	0.79	0.75	4%
RQR3	2	1.23	1.23	1.23	1.22	1%
RQR3/60°	2	0.78	0.78	0.89	0.68	19%
W-80	4	1.06	1.06	1.09	1.03	3%
RQR9-L	2	1.04	1.04	1.04	1.03	0%
RQR9-H	2	1.05	1.05	1.07	1.04	2%
Cs-137	2	0.69	0.69	0.70	0.69	0%
photon all	14	1.04	0.99	1.23	0.68	18%
All	22	0.86	0.81	1.23	0.14	42%

outliers: 4 of 22 **fraction of outliers: 18%**





Summary 1

SEIBERSDORF LABORATORIES

Number of participating systems was increasing (from 59 to 72)

Radiation qualities:

- For x-rays wide sprectra qualities (W-80) and Diagnostic qualities (RQR3) qualities were used
- For Betas Kr-85 and Sr/Y-90 were used as in 2008

Fraction of outliers :

- 43% systems show no outliers of the trumpet curve criteria.
- **56% systems fulfil the ISO 141406 performance criteria** (max. 2 outliers are allowed)

- **Overall performance results - number of outliers:** increased (from 16% to 13%)
- Ph performance increased (from 18% to 16%)
- PhB performance increased (from 8% to 4%)

Summary 2

SEIBERSDORF LABORATORIES

Responses:

- Median response for Photons **1.10**
- Median response for Betas 0.66

Calibration:

- Better results could be achieved by improved calibration procedure by some services

Radiation qualities/Problems:

- The radiation Quality Kr-85 and Sr/Y-90 show significant under response by most systems

Coefficient of variation:

- Typical CV for identical irradiation condition are 2 - 10%

Plans for the future

Next Intercomparison

SEIBERSDORF LABORATORIES

IC2008
IC2009$_{ext}$
IC2010
IC2012
IC2012$_{n}$
IC2014
IC2015$_{ext}$
IC2016
IC2017$_{n}$

Intercomparison for whole body dosemeters (photons and neutrons)

Registration for IC2016 (whole body)

SEIBERSDORF LABORATORIES

Contact: coordinator@ic2016.org
Registration: http://www.ic2016.org