Technical Visit on

Coincidence summing and geometry correction in gamma spectrometry

IAEA Laboratories, Seibersdorf, Austria

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Geometry correction

Canberra Genie 2000/LABSOCS

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Detectors parameters

Parameter	Detector A	Detector B	Detector C	Detector D	Detector E	Detector F
Crystal type	p	n	p	n	p	n
Crystal material	Ge	Ge	Ge	Ge	Ge	Ge
Crystal diameter (mm)	60	60	76.2 (60)	82.55 (60)	101.6 (90)	101.6 (80)
Crystal length (mm)	60	60	133.4	133.4	60.3	134.4

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Samples parameters

| Parameter	Reference	Point	Filter
Sample diameter (including container) (mm)	60	0.0	80
Sample height (including container) (mm)	20	0.0	3
Sample material	Water	-	Cellulose
Container-to-detector-window distance (mm)	0.0	1.0	0.0

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Samples materials

Material	Density (g/cm^3)	Chemical formula
Water	1.00	H_2O
Cellulose	0.20	$C_6H_{12}O_6$
Plastics (polystyrene)	1.05	C_8H_9

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ET factors_reference-to-point

Reference-to-point_p type

- d=76.2 mm_L=133.4
- d=60mm_L=60mm
- d=101.6mm_L=160.3mm

Reference-to-point_n type

- d=82.55mm_L=133.4mm
- d=60mm_L=60mm
- d=101.6mm_L=134.4mm
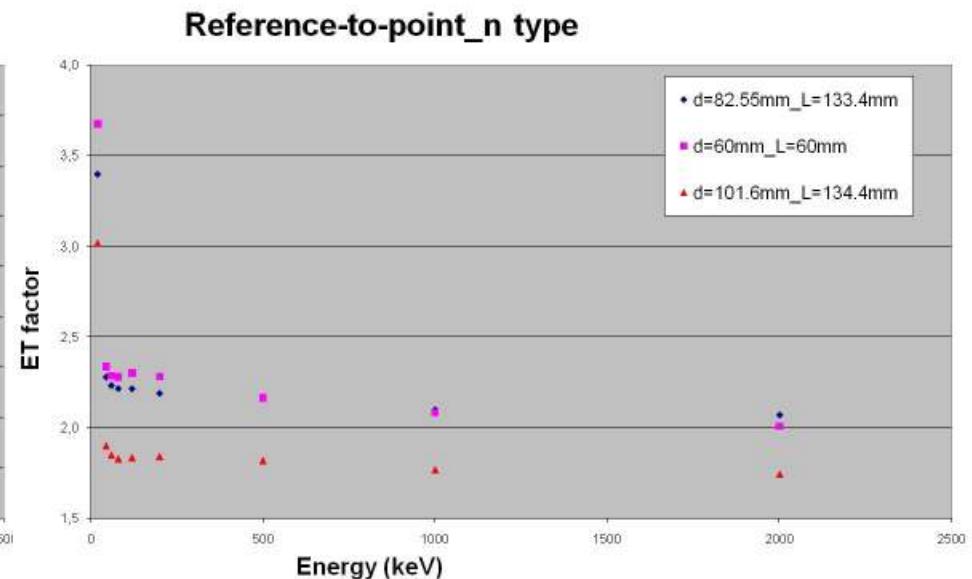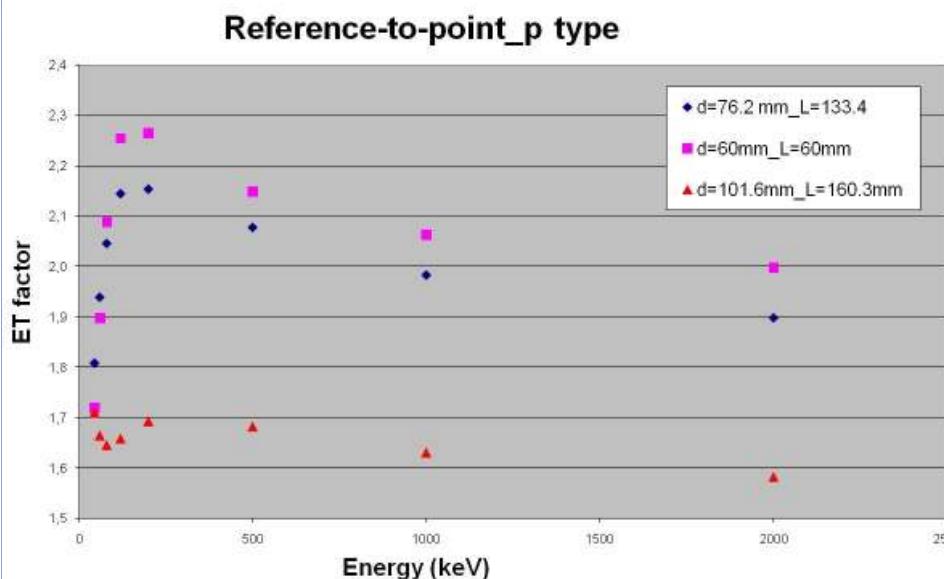
E > 200 keV: **CF** ↓ **if E** ↑

E < 200 keV: **CF** ↓ **if E** ↓

**CF** ↓ **if E** ↑ in the whole considered energy range.

Both for p and n type, lower geometry effect with increasing detector dimensions ⟹ detector is dominant

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ET factors_reference-to-filter

Reference-to-filter_p type

- d=76.2mm_L=133.4mm
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Reference-to-filter_n type

- d=82.55mm_L=133.4mm
- d=60mm_L=60mm
- d=101.6mm_L=134.4mm
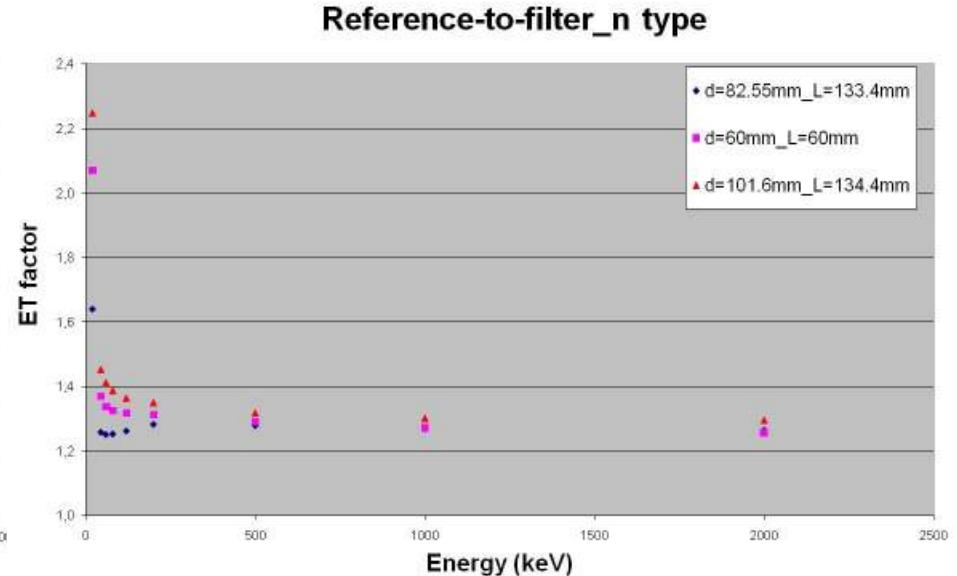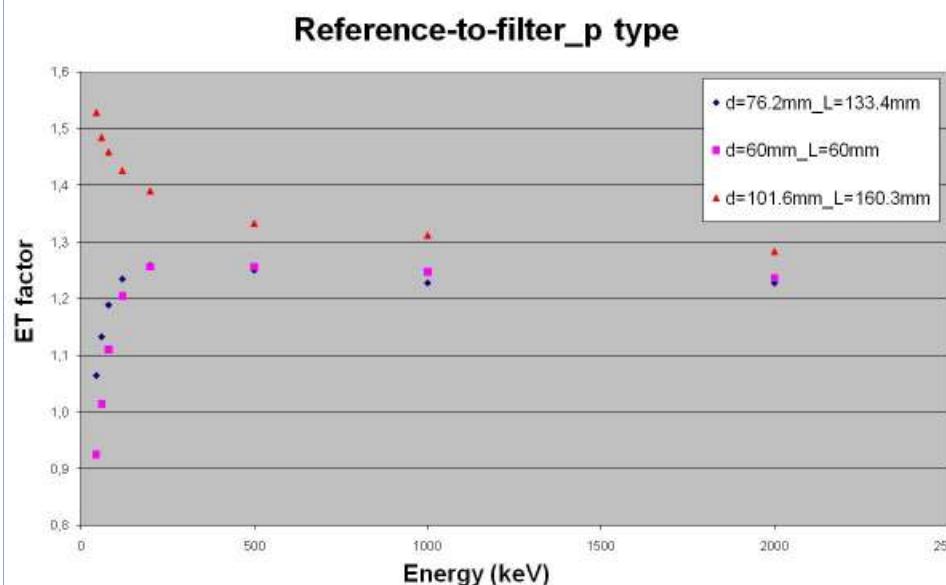
E > 200 keV: CF ↓ if E ↑

E < 200 keV: CF ↓ if E ↓ for pink and blu
CF ↑ if E ↓ for the red (larger detector)
(higher geometrical efficiency)

CF ↓ if E ↑ in the whole considered energy range.

Both for p and n type, higher geometry effect with increasing detector dimensions ➡️ **sample geometry is dominant**

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References

[1] T. Vidmar et al. *Testing efficiency transfer codes for equivalence.* Applied Radiation and Isotopes 68 (2010) 355-359

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