DEMA DANISH EMERGENCY MANAGEMENT AGENCY

Uncertainties in Mobile Gamma Spectrometry

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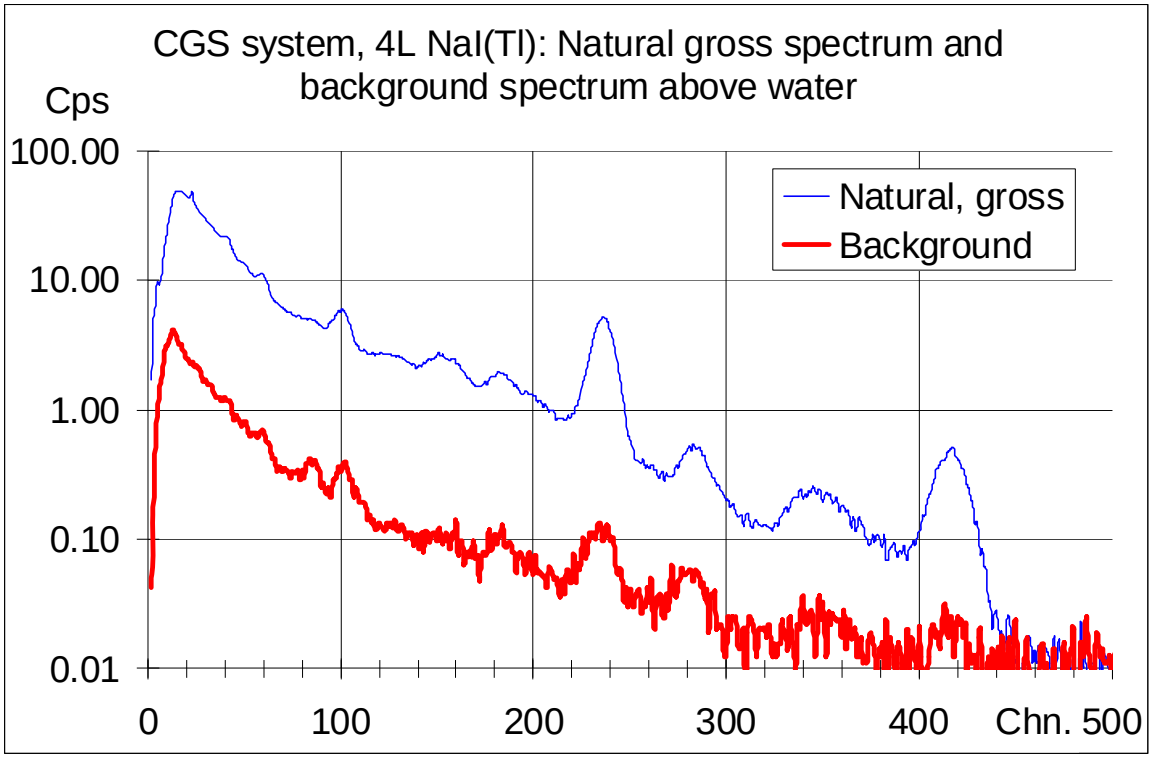
NKS GammaSem 2010

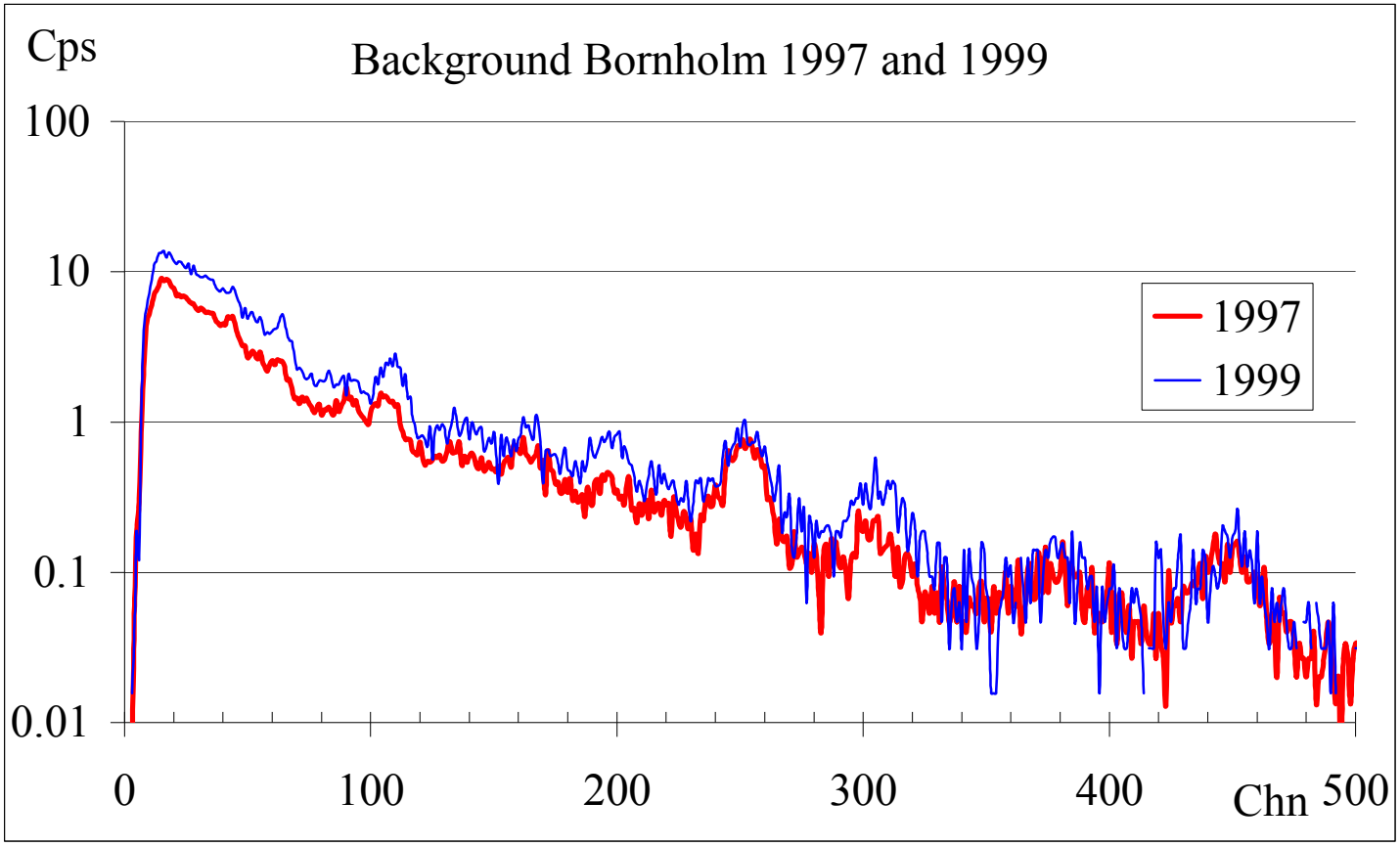
Mobile Measurements: Considerations

- Stable energy calibration
- Altimeter calibration
- GPS calibration
- Sufficiently low altitude
- Size of survey grid
- Measurement live time
- Reasonable (..) survey speed
- Proper soil sampling procedures
- Proper laboratory soil measurements
- Change of physical circumstances (detection geometry)
- Sufficient knowledge of self-introduced background
- Changes in airborne natural background
- Degenerating equipment
- Changing surroundings (land use, building materials)
- Shielding
- Distance to source

System and Natural Background I



System and Natural Background II



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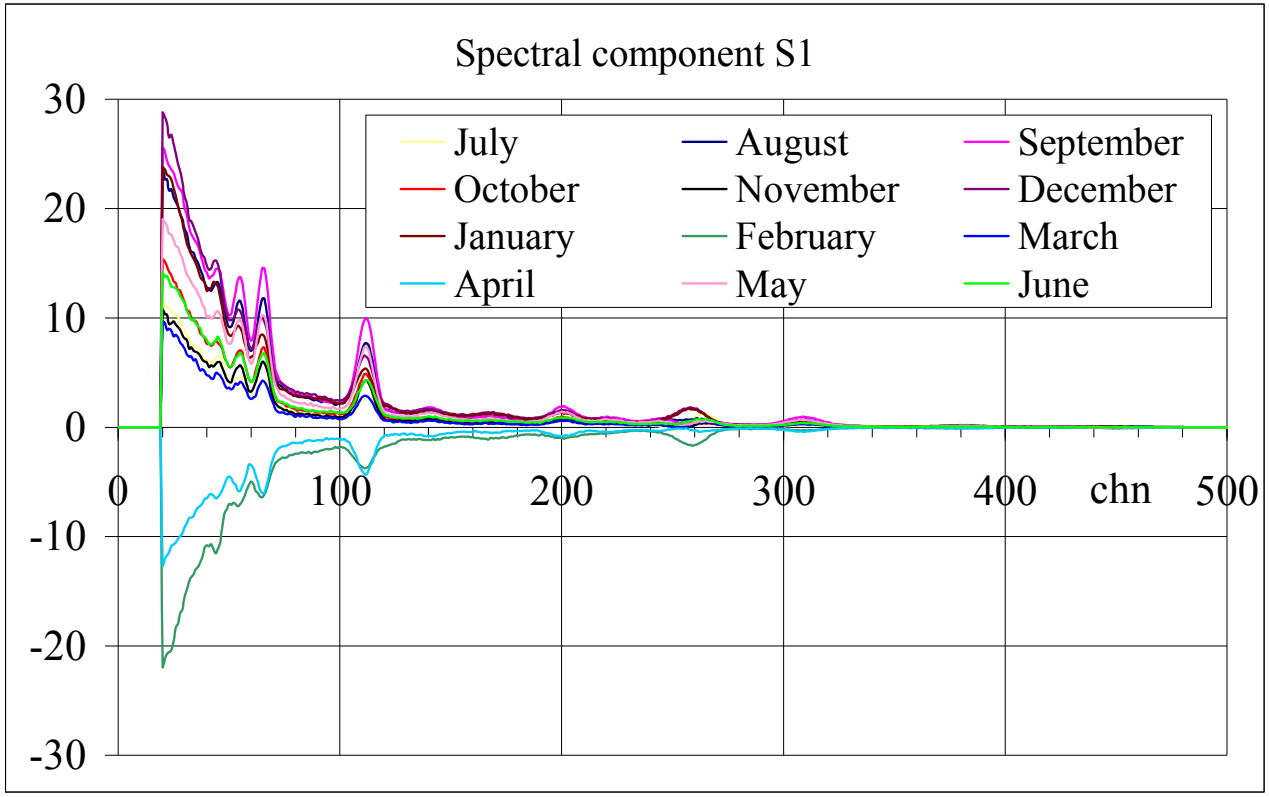
Annual Background Variations



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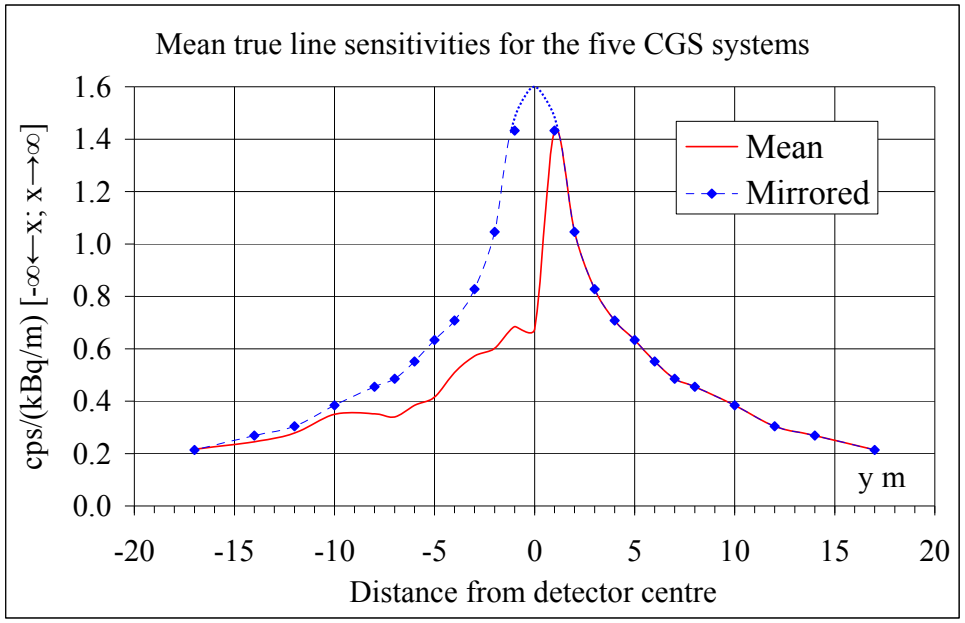
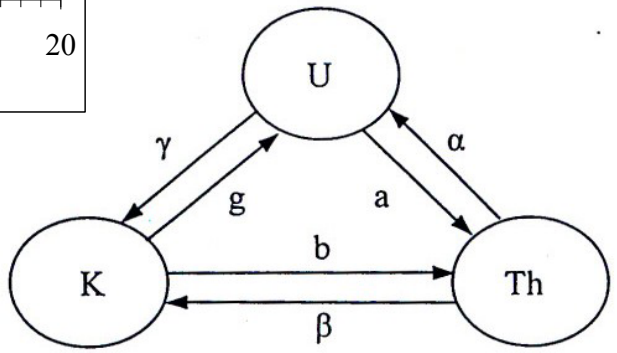
Sensitivities and Stripping





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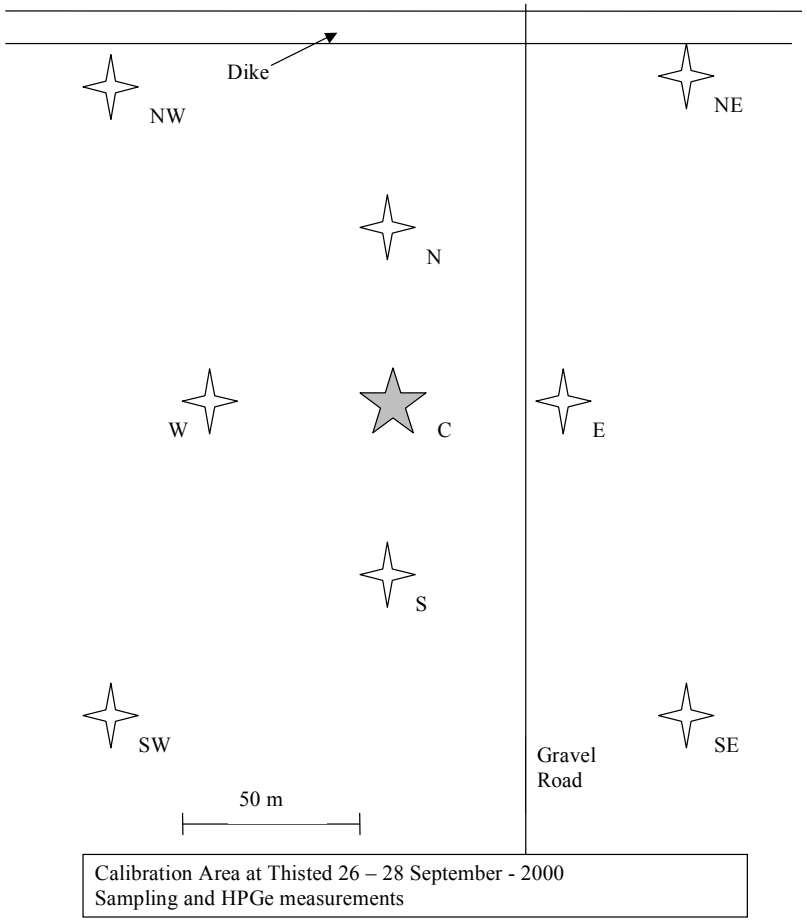
Soil Sampling: Shovels and Laboratories I



Soil Sampling: Shovels and Laboratories II

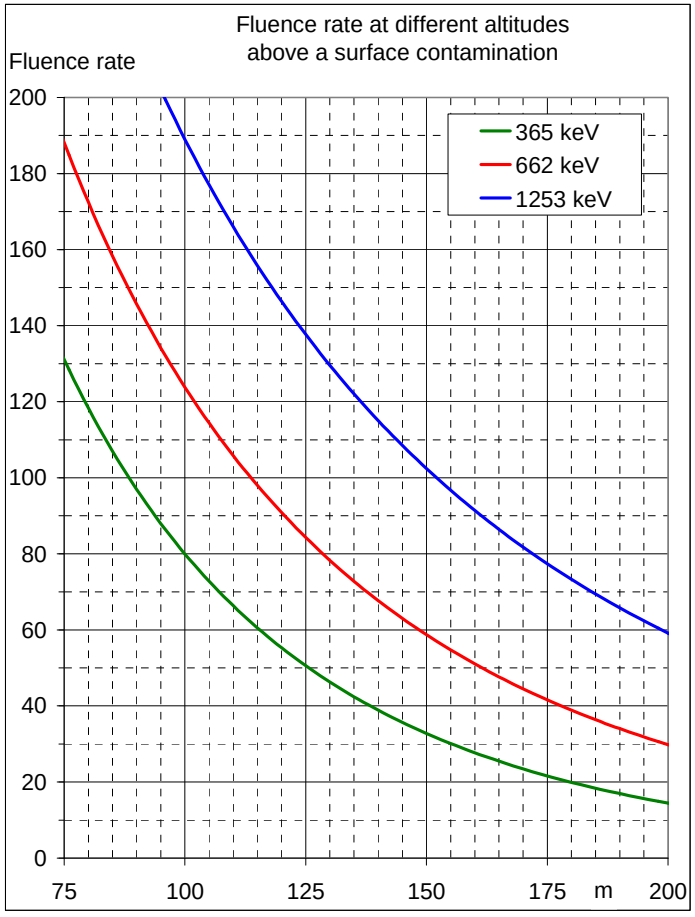
Results from soil sampling and laboratory measurements

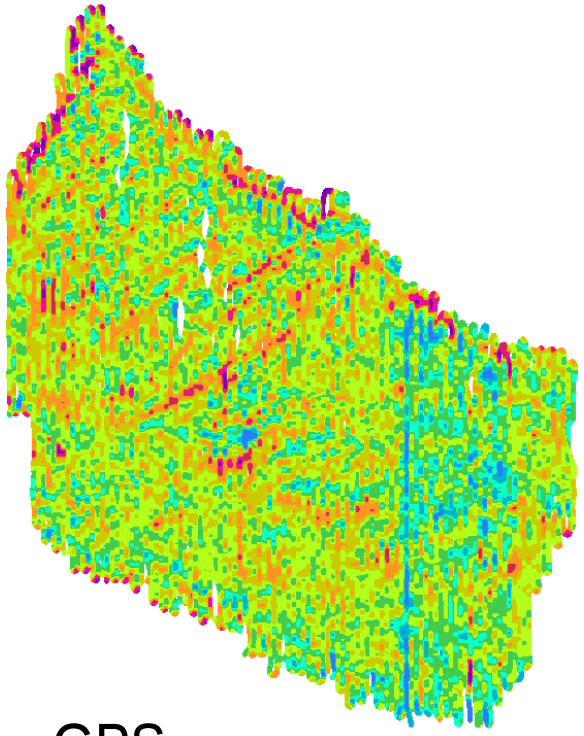
Place	Density	U (Ra)	U (Rd)	Th	K
C (center)	1.695	1.550	1.259	3.904	1.196
W	1.632	1.477	1.348	4.047	1.155
N	1.875	1.207	1.064	3.605	0.989
E	2.232	1.501	1.184	4.058	1.083
S	1.917	1.557	1.195	3.836	1.135

Layered sample from undisturbed soil. Inventory of ^{137}Cs.

	Layered	mass (g)	Volume	cps	cps %	kBq/m2
Bottom	A	741.65	420.62	0.00553	15.98	0.534
	B	654.9	420.62	0.00627	18.11	0.605
	C	601.2	420.62	0.01050	30.35	1.014
Topsoil	D	731.7	420.62	0.01230	35.55	1.188
Total		2729.45	1682.49	0.03460	100.00	3.341

Altitude Variations and Dependencies





GPS

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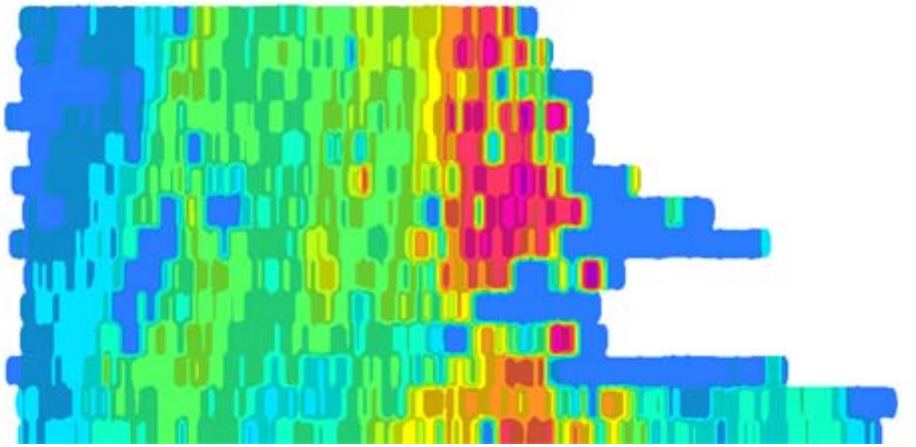
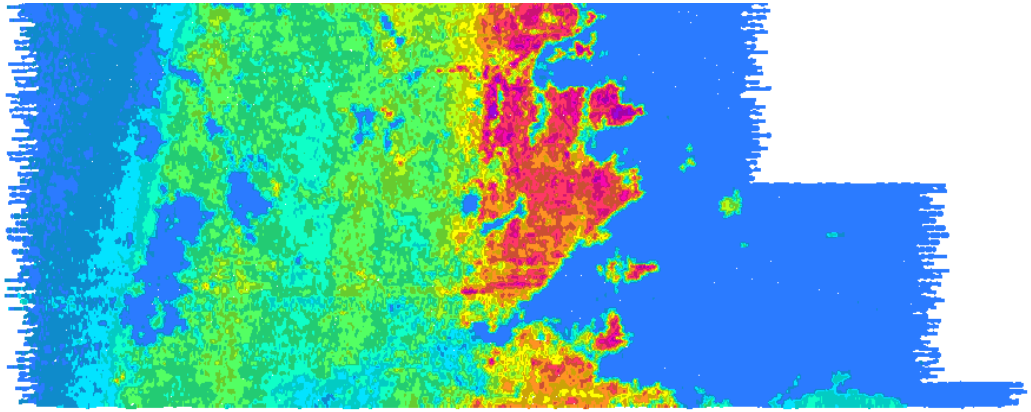
Line Spacing and Gridding

2000m



200m



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