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WinGCF – a commercial software for TLD glow-curve deconvolution

Christoph Ilgner, TS-LEA, March 22, 2005

result of a market survey for the passive radiation monitoring of CMS (preliminary planning: TLD and Alanine)



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available Harshaw TLDs

Dosimeter Materials, shapes

Type Material	Main Characteristic	Useful Range
TLD-100 LiF	natural Nearly tissue equivalent	10 μ Gy - 10 Gy
TLD-100H LiF: Mg, Cu, P	Greater sensitivity	1 μ Gy - 20 Gy
TLD-600 LiF	Neutron sensitive	10 μ Gy - 10 Gy
TLD-600H LiF: Mg, Cu, P	Greater sensitivity	1 μ Gy - 20 Gy
TLD-700 LiF	Neutron insensitive	10 μ Gy - 10 Gy
TLD-700H LiF: Mg, Cu, P	Greater sensitivity	1 μ Gy - 20 Gy
TLD-500 Al ₂ O ₃ :C	High sensitivity	0.05 μ Gy - 1 Gy
TLD-200 CaF ₂ : Dy	Environmental, High sensitivity	0.1 μ Gy - 10 Gy
TLD-400 CaF ₂ : Mn	Environmental	0.1 μ Gy - 100 Gy

Chip Dimensions (as from Thermo Electron):

3.175 mm x 3.175 mm (0.125" x 0.125"), Chip Thicknesses: 0.15 mm to 0.9 mm (0.006" to 0.035")

Circular: 3.0 mm (0.12") and 3.6 mm (0.14") dia x 0.01" and 0.015"

Chip reuses: 500 in cards, 50 in EXT-RAD or DXT-RAD dosimeters.

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software properties

„Software for computerized glow curve deconvolution for dosimetric and scientific purposes“

fits single glow curve peaks, even for low glow curves

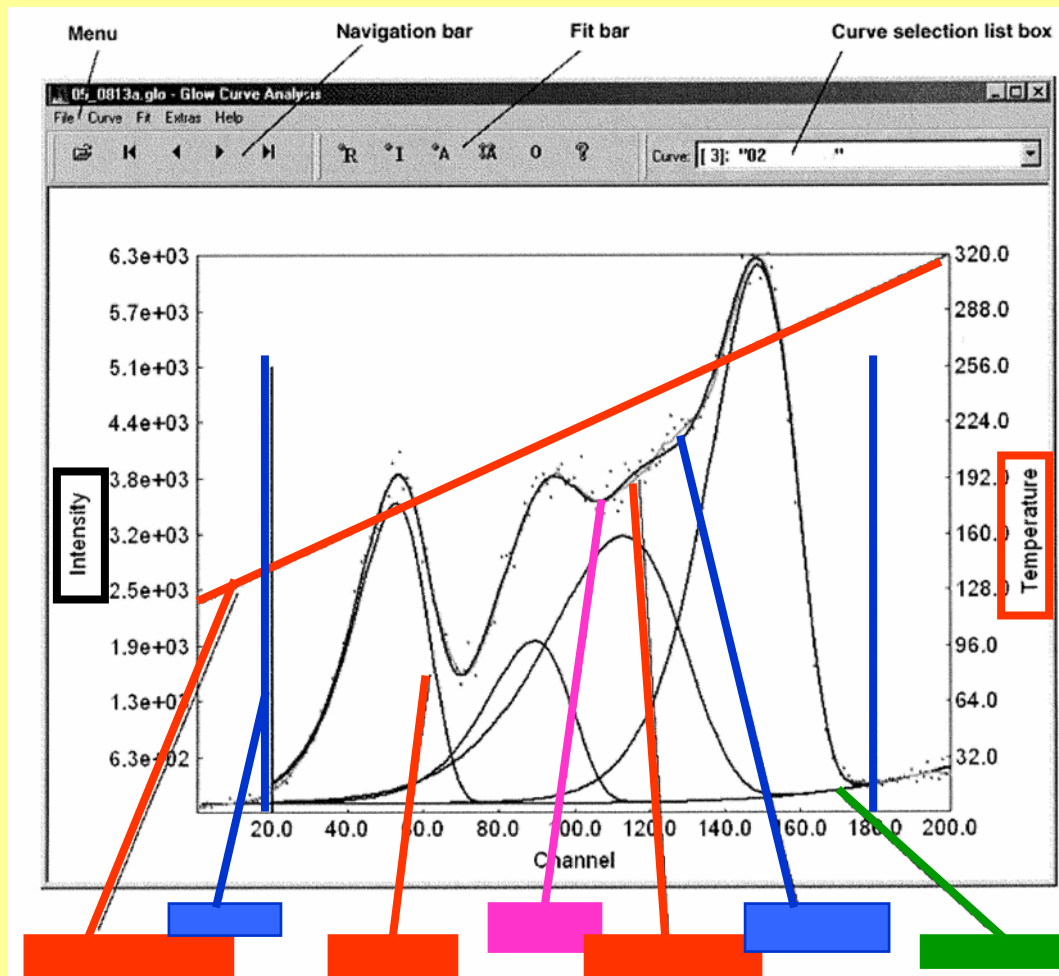
provides methods for smoothing glow curves and subtracting background curves

OLE automation interface for MS VisualBasic applications (for macros within MS Excel or MS Word).

includes fit routines and simple curve mathematics

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example



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conclusion

A TLD system with up-to-date software can

- automatically anneal the TLDs
- subtract the background and fit the curve
- deconvolute the glow-curve peaks, suppressing unwanted ones, and thus improve precision.

It

- saves time and manpower for pre-annealing
- offers state-of-the-art interfaces to database structures.