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110°C QUARTZ PEAK: A NEW NORMALIZATION FACTOR

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It is well known that in our attempt to measure the total archaeological dose a pottery sample has received since the last firing, we follow the "additive procedure" which simulates the natural TL acquisition. The construction of the first built up curve is usually made by using the following normalization procedures:

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- 1) By adding beta doses to quartz samples, heated to 500°C with subsequent normalization with a monitor beta dose. This drainage of a sample often causes a significant change of TL sensitivity due either to a transparency change associated with mineralogical alterations brought about by heating of the sample (Tite, 1966) or to more subtle effects arising from the radiation dose received before drainage, the "predose", (Fleming, 1975) or may be attributed purely to rearrangements of the impurity ions (centres or traps) during cooling.
- 2) By heating to 500°C and weighing the samples.

A new normalization procedure that has been adopted here is based on the sensitive 110°C quartz peak or the 120°C feldspar peak, with many advantages in mind. Prior to any irradiation or read out, the sample is administered a dose of the order of 1-4 rads and subsequently heated to approximately 120°C, followed by heating to 500°C. The procedure is otherwise the "additive" as described above in (1). By this way, the high temperature peaks of quartz are normalized with the 110°C peak reading. Therefore, the first built up curve is made by avoiding complications of crystal sensitivity changes.

This technique has been successfully applied to a dating programme on ancient Hellenic artifacts (Liritzis, 1979). Some results are shown in table 1. Comparisons of TL/110°C with other normalization procedures (i.e. TL/rad and TL/mg) gave satisfactory results.

M. J. Aitken has shown this normalization to be valid using the low temperature peak of calcite (Ancient TL #9, p. 13).

It is thus our pleasure here to verify and recommend this technique for quartz.

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TABLE 1

Sample	Peak (°C)	Normalization Technique	Intercepts (Rads)		Total Dose (Rads)
			Q	I	
SKB(1)98	350	TL/mg	3390	-30	3360
	350	TL/110°C	3070	-110	2960
SK14	335	TL/mg	2450	-45	2410
	335	TL/rad	2570	-70	2500
	375	TL/mg	2650	-275	2380
	375	TL/110°C	2940	-340	2600
	425	TL/mg	3150	-500	2650
	425	TL/rad	3090	-430	2660
SKB(1)28	365	TL/mg	2270	75	2350
	365	TL/rad	2460	100	2560
	325	TL/mg	1810	225	2040
	325	TL/110°C	2270	240	2510