

## Thesis Abstract

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**Thesis title :** Luminescence stimulated from quartz by green light : developments relevant to dating

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Since the introduction, in 1985, of optically stimulated luminescence (OSL) for age determination, the technique has become increasingly common as a method of dating.

Light emitting diodes (LEDs) are a convenient and economical light source for the optical stimulation of luminescence. However for work with quartz, green light stimulation with an argon ion laser as light source is usual, particularly because of the low light intensity of light emitting diodes. Replacement of the original green light emitting diodes by newly developed high intensity green light emitting diodes allowed this limitation to be overcome. The new arrangement was shown to be of comparable sensitivity to the traditionally used argon ion laser system.

The optically stimulated luminescence dating method has been advanced with the introduction of the "single aliquot method", which uses one disc prepared from the sample to carry out all the measurements to determine the equivalent dose. A method based on a single aliquot has the advantages of avoiding normalization problems and reducing effort. The original version of this method concerned the infrared stimulation of feldspar and showed success with an additive dose method, in which correction was made for loss of luminescence signal due to repeated preheating and reading of the same aliquot. A similar single aliquot approach has been applied to the stimulation of quartz by green light, involving an alternative method of analysis of single aliquot data. This approach provides comparable accuracy to conventional equivalent dose determination by the multiple aliquot technique.