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10 Abstract

The recent introduction of post-IR IRSL measurement protocols has prompted a 11 resurgence in luminescence applications using feldspar, some of which are affected by 12 13 anomalous fading related signal loss. Many fading-corrected feldspar ages are reported in the 14 literature, however few of those ages have been corrected using the model of Huntley (2006) 15 [Huntley, D.J., 2006. An explanation of the power-law decay of luminescence. Journal of Physics: 16 *Condensed Matter 18(4), 1359-1365*]. Here we present a new **R** function that calculates fadingcorrected ages using the model of Huntley (2006), implemented with either a single-saturating 17 exponential (1EXP) or general-order kinetic (GOK) fit. We evaluate the performance of the 18 model through (i) contrasting measured and modelled field saturation values for a suite of 41 19 published saturated samples, and (ii) through using the model to fading-correct feldspar ages of 20 21 samples with independent age control. Our results indicate that when implemented with 1EXP 22 this model has an accuracy of 10 % for predicting sample saturation, but that independent ages may be overestimated when the model is used to fading-correct samples across a range of 23 timescales. In contrast, providing that the dose response curve has been characterised beyond 24 25 600 Gy, implementing the Huntley (2006) model with a GOK fit yields accurate age estimations. 26 Modelled age overestimation for 1EXP is associated with dose response curve deviation from a single saturating exponential. Finally we contrast the laboratory measured light levels of a suite 27 28 of 50 saturated samples with their corresponding fading rates. We show that these saturated samples may yield D_e values below $2D_0$, and thus that $2D_0$ is not an effective screening criterion 29 30 for sample saturation where no anomalous fading correction is made.

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32 1. Introduction

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