

**S6 Table.**  $D_e$  estimation details for age determination. Equivalent dose ( $D_e$ ) estimation model, cutoff value used for outlier rejection, number of micro-aliquots accepted during data analysis (after outlier rejection) out of the total measured, overdispersion values of the  $L_n/T_n$  or  $D_e$  distribution (depending on age model used) before ( $OD_{total}$ ) and after outlier rejection ( $OD_{nMAD}$ ), expected scatter of a well-bleached  $D_e$  distribution ( $\sigma_b$ ),  $D_e$  and ages are provided for each sample.

| Sample code | Layer | Model                      | nMAD<br>cutoff | Accepted<br>micro-<br>aliquots | $OD_{total}$<br>(%) | $OD_{nMA}$<br>D<br>(%) | $\sigma_b$ | $D_e$<br>(Gy)    | Age <sup>a</sup> (ka) |                                    |
|-------------|-------|----------------------------|----------------|--------------------------------|---------------------|------------------------|------------|------------------|-----------------------|------------------------------------|
|             |       |                            |                |                                |                     |                        |            |                  | Fading<br>uncorrected | Fading<br>corrected                |
| LBB-II      | 5     | nMAD MAM $D_e$             | 1.5            | 34 / 2600                      | $120 \pm 13$        | $54 \pm 9$             | 0.35       | $159.1 \pm 32.6$ | $29.4 \pm 6.6$        | <b><math>33.5 \pm 9.1</math></b>   |
| LBB15-OSL3  | 5     | nMAD MAM $D_e$             | 1.5            | 92 / 3800                      | $90 \pm 7$          | $56 \pm 6$             | 0.35       | $185.3 \pm 24.1$ | $35.0 \pm 5.0$        | <b><math>40.1 \pm 6.2</math></b>   |
| LBB15-OSL2  | 9b    | nMAD CAM $L_n$ -<br>$/T_n$ | 2.0            | 77 / 1800                      | $27 \pm 3$          | $20 \pm 2$             | -          | $661.2 \pm 54.7$ | $163.1 \pm 14.9$      | <b><math>188.5 \pm 19.9</math></b> |
| LBB15-OSL0  | 10c   | nMAD CAM $L_n$ -<br>$/T_n$ | 2.0            | 79 / 500                       | $73 \pm 6$          | $30 \pm 3$             | -          | $585.6 \pm 63.3$ | $134.4 \pm 15.7$      | <b><math>155.1 \pm 22.8</math></b> |

<sup>a</sup> Ages are obtained by subtracting a residual dose ( $10.4 \pm 0.7$  Gy) from the  $D_e$  and dividing by the corresponding dose rate.