The quartz fractions were extracted through traditional separation method (Fan et al., 2010). Equivalent dose (De) values of the quartz fraction from these samples were obtained by measuring OSL signals using a modified double SAR protocol (Banerjee et al., 2001; Roberts and Wintle, 2001). The OSL signal decay and growth curves of these samples are shown in Fig. S1. The phenomenon that the IRSL signal is close to background and OSL signal decays quickly to the background level as indicated in Fig. S1a supports that the luminescence signal is mostly contributed by the fast component of quartz fractions. The natural OSL signal (Lx/Tx) falls into the linear growth segment of the dose response curve (Fig. S1b), indicating that the De values are reliable.

**References**

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