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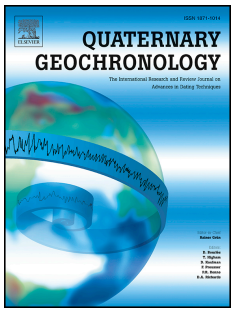

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Testing the accuracy of feldspar single grains to date late Holocene cyclone and tsunami deposits

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Abstract: Quartz is the preferred dosimeter for luminescence dating of Holocene sediments as optically stimulated luminescence (OSL) signals reset rapidly upon light exposure, and are stable over time. However, feldspar is required where quartz luminescence properties are inappropriate for dating, as is often the case in geologically young mountain ranges and areas with young volcanism. Here we aim to evaluate the potential of single grain feldspar luminescence dating applied to late Holocene cyclone and tsunami deposits, for which complete signal resetting can *a priori* not be guaranteed. To address potential problems of feldspar dating of such deposits associated with heterogeneous bleaching, remnant doses and anomalous fading, we use a low-temperature post infrared infrared stimulated luminescence protocol ($pIRIR_{150}$) on single grains.

For most samples, good agreement between fading corrected IR_{50} and non-fading corrected $pIRIR_{150}$ ages is observed. Both feldspar ages generally also show good agreement with age control provided by historical data and quartz luminescence ages. $pIRIR_{150}$ remnant ages in modern analogue samples are shown to be <50 years, indicating that dating accuracy might be negatively affected by insufficient signal zeroing only for sediments younger than ~500 years. As these minor remnant ages are interpreted as being caused by unbleachable luminescence residuals, slight age overestimation for young samples can be overcome by subtracting the remnant ages.

The good agreement between $pIRIR_{150}$, IR_{50} and quartz ages, indicates that a significant number of grains must have experienced relatively complete signal resetting during or immediately prior to transport, as the three signals are known to bleach at different rates. Since light exposure during the