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Preservation of glacial landforms in the high mountains of Taiwan: Insights from in situ cosmogenic 10Be

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Located at the junction of the Pacific Ocean, the Eurasian continent, and the South China marginal Sea, the Taiwanese Mountains are of particular interest for paleo-climatic reconstructions in the East Asian and Western Pacific regions. Though the presence of glacial morphologies in Taiwan was first reported in the early twentieth century, it is only in the recent years that significant time constraints have been brought thanks to luminescence (TL, OSL) and cosmic ray exposure (CRE) dating methods. For example, in North-eastern Taiwan (Nanhutashan area), such data allowed discussing a late glacial or early Holocene glacier advance. However, at the scale of the whole orogen, a critical need for dating still exists in order to better constrain both the timing and glacier extends during the Last Glacial period and during the subsequent glacier retreat at the beginning of the Holocene. In this study, we present new CRE ages of glacial-related geomorphic features in the Yushan and Siangyangshan areas (Central Range) spanning the last 20 ka. According to the denudation rates derived from CRE techniques, this study also represents the opportunity to discuss the preservation of the glacial-related geomorphological features with regard to the strong erosional processes (landslides, backward erosion) that have been modelling the Taiwanese Mountains since their deglaciation.