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Cosmogenic ^{10}Be dating of Guxiang and Baiyu Glaciations

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Guxiang and Baiyu Glaciations are two previously recognized local glaciations of the Tibetan Plateau. They have been widely used as the reference standard for classifying Late Quaternary glaciations on the Tibetan Plateau and its surrounding mountains. However, the numerical chronologies of both glaciations have been lacking. In this study, cosmogenic ^{10}Be dating was undertaken to define the timing of these two glaciations. The surface boulders deposited by the glaciers of the Guxiang and Baiyu Glaciations have exposure ages of 112.9±16.7—136.5±15.8 ka BP and 11.1±1.9—18.5±2.2 ka BP, respectively. It is likely that the Guxiang and Baiyu Glaciations correspond to marine isotope stages 6 and 2, respectively.

Guxiang Glaciation, Baiyu Glaciation, cosmogenic ^{10}Be dating

The Guxiang and Baiyu Glaciations are two of the local glaciation events recognized on the Tibetan Plateau so far. These two glaciations were thought to be comparable with Riss and Würm Glaciations in the Alps, respectively[1]. Subsequently, the two glaciations have been correlated with marine isotope stages 6 and 4 (MIS-6 and MIS-4)[2]. In this study, we undertook terrestrial cosmogenic radionuclide surface exposure (SE) dating to define the timing of both glaciations.

1 Location and setting

The typical glacial landforms of the Guxiang and Baiyu Glaciations are present in the Bodui Zangbo River valley, adjacent to the Big Bend of the Yarlung Zangbo River in the southeastern part of the Tibetan Plateau (Figure 1). The Parlong Zangbo River, originating from the Laigu glacier, flows westward and joins the Yilong Zangbu River at Tongmai, and then flows 40 km southward eventually joining the Yarlung Zangbo River. The Yarlung Zangbo River turns 180° around the Nanmche Barwa Mountain, where the Big Bend forms, and then flows 200 km southward and eventually joins the Brahmaputra River in the Indian Plain. The Bodui Zangbo River, the largest tributary of the Parlong Zangbo River, originates from the glaciers of the eastern Nyainqêntanglha Mountains. Because abundant glacial sediments and well developed landforms are present in the Bodui Zangbo River valley we chose this area to date moraines.

When viewed at a large scale, the study area is located in the junction of the Himalayas, Nyainqêntanglha and Hengduan Mountains. Strong moisture from the Bengal Bay is delivered to this area by the south Asian monsoon through the Yarlung Zangbo River valley. The characteristics of this area can be described as follows: (1) An area with most precipitation on the Tibetan

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