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Water, Ice, and Meteorological Measurements at Xiao Dongkemadi Glacier, Central Tibetan Plateau, Balance Years from 2008 to 2011

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The glaciers on Tibetan Plateau play an important role in the catchment hydrology and climatology of this region. However, our knowledge with respect to water circulation in this remote area is scarce. Xiao Dongkemadi Glacier (XDG) is located near Tanggula Pass (the highest point on the Lanzhou–Lhasa road 5231ma.s.l.), central Tibetan Plateau (33°04′N, 92°04′E). Here, glacier mass balance and runoff directly reflects the glacier's response to local climate change, and glacier changes on the Tibetan Plateau strongly influence human welfare since water supplies in this arid/semi-arid region are predominantly from glacier melt. Due to its remote location, the mass balance of XDG has been monitored discontinuously since 1988 by the direct glaciological method. Recently, a more complete and fine-grained glacier monitoring system has been established on the cap of XDG, and is expected to make further contributions to research on the change of the cryospheric and climatic environment in the area. Winter snow accumulation and summer snow and ice ablation were measured at XDG, to estimate glacier mass-balance quantities for balance years from 2008 to 2011. Runoff from the basin containing the glacier and from an adjacent nonglacierized basin was gaged during all or parts of water years from 2008 and 2011. Air temperature, wind speed, precipitation, and incoming solar radiation were measured at selected locations on and near the glacier.