

西クンルン山脈における氷河サージ Surging glacier in West Kunlun Shan

安田 貴俊^{1*}; 古屋 正人²
YASUDA, Takatoshi^{1*}; FURUYA, Masato²

¹ 北海道大学大学院理学院, ² 北海道大学大学院理学研究院自然史科学部門
¹Graduate School of Science, Hokkaido University, ²Department of Natural History Sciences, Hokkaido University

Surge-type glacier quasi-periodically oscillate between long periods of slow flow (quiescent phase) and shorter periods of typically 10-1000 times faster flow (active phase). Only about 1% glaciers worldwide are of surge-type (Jiskoot et al., 2000), but some glaciers were not identified as surge-type due to long surge cycle. During a surge cycle, glaciers advance and retreat without external factor so surge-type glaciers obscure the climate signal. Several controlling processes are identified but it is still elusive what trigger switch from slow to fast flow. Owing to the difficulty of observation, spatiotemporal data of surging glacier are still less.

West Kunlun Shan (WKS), located in northwestern Tibetan plateau, is one of the most glaciated regions in Asia. The annual mean temperature and precipitation is very low, ~14 deg. C and 460mm, respectively (Zhang et al. 1989). Main precipitation occur in Summer (Ageta et al., 1989). Almost debris free and polythermal glaciers develop under subpolar environment.

We detected glacier surge, its velocity changes in WKS using Synthetic Aperture Radar (SAR) techniques, based on SAR archived data from 1990's. Also we detected the changes of glacier terminus using a box measurement method (Moon and Joughin, 2008), based on Landsat optical-images archived from 1972.

We paid attention to 36 glaciers in WKS. Five glaciers surged during 1990-2013 and three of them were continued by late 2013. The velocity gradually increased up to ~1000m/year accompanied with advancing ~1.4km, and then degreased to ~30m/year. Also, two glaciers were in quiescent phase during our observation periods. These glaciers rapidly retreated and had stagnant profiles in the lower part. We could not observe whole a surge cycle that was estimated at least 40 years.

キーワード: 氷河サージ, 西クンルン, SAR, ピクセルオフセット, 氷河流動
Keywords: Glacier Surge, West Kunlun Shan, SAR, Pixel offset, Glacier velocity