

# The surface change of glacier-derived rock glacier in the northern Tien Shan

\*Shun Okuyama<sup>1</sup>, Chiyuki Narama<sup>1</sup>, Hideyuki Takadama<sup>2</sup>

1. Niigata University, 2. PASCO Co.

Rock glacier is known as indicator landforms for mountain permafrost. The surface is covered with debris about boulders, and the interior is composed of permafrost mixed with ice and debris. Rock glacier, like glacier, is one of the periglacial landform that flows due to creep of internal ice. Rock glacier is classified into "talus-derived type" and "glacier-derived type" based on the source of debris and internal ice (Matsuoka, 1998). "talus-derived type" is a type in which residual snow or underground water becomes a source of permafrost and develops on the cliff formed by gravel supplied from the bedrock behind it. "glacier-derived type" is a type in which a glacier exists superior of a rock glacier and develops from glacier ice and melted water from the glacier. "talus-derived type" is found worldwide and there are many research cases, but the distribution of "glacier-derived type" rock glaciers is limited, and its development process is not clear. In this study, in the northern Tien Shan, the surface flow of "glacier-derived type" rock glaciers was separated using DInSAR (Differential Interferometry SAR) and image matching, and the surface flow of the "glacial-derived type" was considered.

Keywords: rock glacier, mountain permafrost, DInSAR, image matching, Tien Shan