



## **The Grigoriev Ice Cap front flow as indicator of glaciers degradation in Tien-Shan (Central Asia)**

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Grigoriev Ice Cap surface changes were obtained by using two-dimensional flow line model taking into account symmetric ice flow divergence (convergence). The model contains diagnostic equations that include continuity equation and equilibrium equation in terms of stress deviator components, and prognostic equation or mass-balance equation.

The numerical solution of prognostic equation was obtained for one year time step. Annual averaged ice surface mass balance was approximated by linear function of the altitude. Annual averaged ice surface mass balance at the Grigoriev Ice Cap summit (4600 m a.s.l.) approximately equals to 0.6 m/a and decreases to -0.8 m/a at the ice front (4100 m a.s.l.).

Essentially the investigation was focused at the Grigoriev Ice Cap front flow. The forecast of the ice cap front flow for 50 years was obtained. The results of diagnostic and prognostic equations solutions revealed the ice cap degradation at the lower part of ice cap at distance about 2.5 km from the ice cap summit. The ice front moving back with velocity is about 2 m/a because of ablation dominance at the lower part of ice cap.