Re-evaluation of past summer temperature reconstruction by melt features in Belukha ice cores, Russian Altai


Belukha Glacier

- In August 2003, Japan group drilled 171 m long ice core.
- In July 2001, Swiss-Russian group drilled 140 m long ice core.
Comparison with Swiss core (accumulation and MFP)

Annual accumulation: no significant correlation ($r=0.02$)

5-year running mean: significant correlation ($r=0.78$, $p<0.01$)

Annual MFP: significant correlation ($r=0.47$, $p<0.001$)

The harmonic fluctuations show representativeness of MFPs as climatic proxy.
Reconstruction of summer temperature

- $T_{\text{ref}}$ : “Reference temperature” derived from instrumental temperature.
- KH06 : The empirical formula in the previous study [Henderson et al. 2006].
- $T_{\text{MR}}$ : Multi-regression formula derived from MFP and annual accumulation.

$$T_{\text{MR}} = 0.0045 \times AMT + \frac{65}{b_a} - 5.3$$

$AMT$ : annual melt feature thickness (mm)  
$b_a$ : annual accumulation (mm w.e.)