Research station «Ice Camp «Cape Baranova» (79N, 101E) - possible candidate to BSRN

V. Kustov, A. Makshtas, V. Sokolov
Arctic and Antarctic Research Institute,
St. Petersburg, Russia
Re-opened in June 2013
Under development
Area of the ice base is one of the least investigated regions of the Arctic Ocean. Pending the whole complex of meteorological be installed, the Ice Base “Cape Baranova” may pretend for a full partnership in the network of the International Polar Observatories, similar to Tiksi with a perspective to become a second regional station in the Russian Arctic and further as a global station in the GAW.
Main goal of establishment Observatory "Ice Base Cape Baranova" is to identify the causes and consequences of climate change in the Arctic with special attention to the comprehensive studies of interrelated components of the Arctic climate system:
- surface heat and radiation balance;
- cloudiness and aerosol components of the atmosphere;
- processes of gas - and mass transfer;
- chemical composition of atmosphere and hydrosphere;
- melting of permafrost;
- study of drifting, fast and lake ice;
- characteristics of hydrological regime of the Shokalski Strait and western Laptev Sea
- dynamics of glaciers.
The route from Saint Petersburg to “Ice Base Cape Baranova”

Airplane

Helicopter

Refueling at the Cape Cheliuskin

Bolshevik Island
Observatory "Ice Base Cape Baranova" from height 500 m
Observations and studies beginning May 2014

Standard meteorological observations
Standard and advanced solar radiation observations
Route surveys of spectral albedo
Upper-air observations
Monitoring of greenhouse gases
Heat balance observations
Studies of physical - mechanical properties of fast ice
Testing of new devices for measurements of freshwater and sea ice thickness
Oceanographic investigations in the Shokalski Strait
Organization of polygon for glaciological investigations at the glacier Mushketov
Hydrological studies
Standard meteorological observations with automatic station MAWS – 420
Instruments for special meteorological observations
Installations for spectral albedo, turbulent fluxes and reflected short and long-wave radiation
Comparison of cloud camera data with data of visual observations.
Measurements of short-wave and long-wave radiation balance and spectral intensity of direct solar radiation
Measurements of atmospheric boundary layer temperature with profiler MPT-5

Inversions in ABL (0 – 1000 m) in June - September 2015

Interface of MTP-5PE
Upper-layer observations (Radiosoundings and Ozone soundings)

Characteristics of tropopause seasonal variability
Study of greenhouse gases and aerosol at at the “Ice base cape Baranova” (left) and HMO Tiksi (right)

Temporal variability of carbon dioxide at the “Ice base cape Baranova” (left) and HMO Tiksi (right)
First results of BC measurements at the Cape Baranova

**Black carbon measurements, November 2015**

- BC, 6 min
- BC running mean

**OC, EC on Cape Baranova.**

**EBC on Tiksi**

April and March 2015

- EBC Tiksi the same sampling time
Characterization of physico-chemical properties of aerosol in the Arctic

PARTICULATE POLLUTION PROGRAMM

BC measurements;
Aerosol characterization:
- individual particle analyses,
- organic and elemental carbon,
- ion components,
- chemical markers of pollution.
Fast ice formation in area of “Ice base Cape Baranov” in 2013
Morphometric characteristics of fast ice in the station area
The structure of level fast ice and its temporal variability in summer
Waves in fast ice and on the Island Bolshevik shore
Hydrological studies
Oceanographic section in the Shokalski island
Welcome to Observatories “Tiksi” and "Ice Base Cape Baranova"