



Modeled surface heat fluxes over Terra Nova Bay polynya

Sandra Morelli

University of Modena and Reggio Emilia, Dept. of Physics, Modena, Italy (sandra.morelli@unimore.it)

Polynyas play an important role in the meteorology and oceanography of the polar regions and in the ocean general circulation.

A winter event of Terra Nova Bay polynya, is studied by a recent version of the atmospheric, mesoscale Eta model. Currently, the Eta model distinguishes open water grid points and thick sea ice grid points by a mask which is established as initial condition and remains fixed in the simulations. In the days of the event the most of the model integration domain is under polar night condition and, in particular, the Sun is below the horizon at TNB. Thus, available AVHRR image does not contain the visible channels but only the thermal ones. In channel 4 (11.5 μm), AVHRR imagery show the area of TNB with a well developed warm area, corresponding to the polynya as revealed by AMSR-derived SIC maps, surrounded by much colder pack ice. Brightness temperature, hailing from the satellite observations, decreases as one moves away from the coast towards the Ross Sea. A multi-regions polynya was introduced in the model using different skin temperatures in order to take some account of the variation of temperature with the distance from the coast. The polynya is therefore depicted as consisting of a warm inner region, and two zones gradually colder. The surface heat fluxes, calculated over the polynya, and the impact of polynya on the air above it will be presented.