

Cooling by the melting of snowfall on the Toyama Plain during the winter monsoon

YOSHIKANE, Takao^{1*} ; MA, Xieyao¹

¹Japan Agency for Marine-Earth Science and Technology

The peaks of the appearance frequency of the surface air temperature during precipitation are clearly observed near the melting point of water on the Toyama Plain during the winter monsoon. The peaks could be explained by the hypothesis that the melting of snowfall is the primary cause of the cooling on the Toyama Plain. To verify this hypothesis, we investigated the relation of temperature between the inland and the coast using observed data in January from 1990 to 2009 and applied a simple estimation method of the cooling due to the melting of snowfall. The temperature on the Toyama Plain tends to remain around the melting point when the surface air temperature on the coast is higher than 273.15 K and lower than 277.15 K, which almost corresponds to the changeover from snowfall to rainfall. The relation is unclear when hardly any precipitation is observed. The simply estimated cooling by the melting of snowfall using the observed precipitation can also represents the cooling on the Toyama Plain. Accordingly, the local climatic temperature could be greatly influenced by advection of the air mass cooled by the melting of snowfall until the air mass reaches the Toyama Plain during the winter monsoon.

Keywords: snowfall, cooling of melting, surface air temperature, winter monsoon