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SURFACE FLUX MEASUREMENTS AT KING SEJONG STATION IN WEST ANTARCTICA

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The Antarctic peninsula is important in terms of global warming research due to the pronounced increase in air temperature over last century. However, the reasons for the increase in the temperature are not clear. To understand how the global warming, which may be one reason for the increased temperature in the Antarctic peninsula, influences the regional climate change, we should understand the interaction between the global warming and the regional climate. For that, the understanding of the exchange processes between the land surface and atmosphere and the measurements of surface fluxes of heat, water vapour and CO_2 are basically required. Since the Antarctic peninsula has some area, which is exposed to the atmosphere during summer season, the interaction between the land surface and the atmosphere should be different from that at other area with ice and snow. The eddy covariance system was established and turbulent fluxes of heat, water vapor, CO_2 and momentum have been measured directly at King Sejong Station (62°13´S, 58°47´W) located in the northern edge of the Antarctic Peninsula since December in 2002. Here we report results on the energy partitioning in the four austral summer seasons. The study site consists of small rock and gravel with various lichens and moss. In summer season, maximum downward shortwave radiation reached up to over 1000 Wm^{-2} and monthly averaged air temperature was over 0 ℃. The air was dry with absolute humidity of < 10 gm^{-3}. The wind was relatively strong. Based on flux footprint analysis, measured flux came from within 100 m around the tower, where lichen and moss covered the flux source area. The partitioning of net radiation into sensible heat and latent heat fluxes depended on the wind direction due to the different land surface with and without snow and the Bowen ratio (=sensible heat flux/ latent heat flux) was significantly greater than 1 at melt area. In presentation, detailed energy partitioning with wind direction and its year-to- year variability will be shown.

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