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**Title:** *THE DIURNAL COURSE OF THE RADIATION BALANCE IN THE AREA OF KAFFIØYRA (NW SPITSBERGEN) IN THE SUMMER SEASONS OF 2010-2012*

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This paper describes changes in the following individual components of the radiation balance: total incoming solar radiation ( $K\downarrow$ ), outgoing solar radiation ( $K\uparrow$ ), terrestrial radiation ( $L\uparrow$ ), atmospheric radiation ( $L\downarrow$ ) and the short- and long-wave balances for the three kinds of surface, typical of Spitsbergen: moraine, tundra and glacier.

The research was conducted in the area of Kaffiøyra and the Waldemar Glacier (NW Spitsbergen) in the summers of 2010, 2011 and 2012, using a Kipp&Zonen CNR 4 net radiometer. In the comparable period of 21 July to 31 August the most favourable radiation balance occurred in the tundra ( $5.98 \text{ MJ m}^{-2}$ ) and on the moraine ( $5.98 \text{ MJ m}^{-2}$ ), whereas on the Waldemar Glacier's firn field it did not exceed  $2.80 \text{ MJ m}^{-2}$ . In the diurnal course the highest values of  $K\downarrow$  and  $K\uparrow$  were recorded at all sites between 12:00 and 13:00 hours local time, i.e. at the upper culmination of the sun, whereas the lowest values were recorded at midnight, when the sun was at its lower culmination. The maximum intensity of solar radiation reached  $881 \text{ W m}^{-2}$  on the moraine. The surface albedo varied depending on the type of surface from 14% in the tundra, through 16% on the moraine, to 57% on the glacier, and increased at low elevation of the sun above the horizon. The values of terrestrial radiation ( $L\uparrow$ ) amounted to  $30.4 \text{ MJ m}^{-2}$  on the moraine and  $31.1 \text{ MJ m}^{-2}$  in the tundra, but  $29.1 \text{ MJ m}^{-2}$  on the chilled glacial surface. In the diurnal course, the values of  $L\uparrow$  increased at daytime when the surface temperatures were the highest. The values of  $L\downarrow$  on the other hand, did not vary significantly between the sites, and their diurnal course was uniform. The values of the radiation balance were the highest at midday, and negative values were observed at night, especially at the end of the research season when the polar day ended (after 24 August). Particularly low values were recorded on the glacial surface.

The diurnal course of the individual components of the solar radiation balance is affected by cloudiness and other phenomena which restrict the influx of radiation.