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Surface Radiation Characteristics of the Ali Area, Northern Tibetan Plateau

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This study analyses the diurnal seasonal mean and the seasonal and annual variation in the radiation budget at the Ali Meteorological Bureau observation station in the northern Tibetan Plateau for 2019. The results indicate that the daily average variation in incidental shortwave and reflected radiation across all seasons in the Ali area had typical unimodal symmetry. The average daily variation in incidental shortwave radiation was in phase with reflected radiation, but the amplitude of the incidental shortwave radiation was greater than that of reflected radiation. The daily amplitude, daily average, and monthly average upwelling longwave radiation were greater than those for downwelling radiation, and the diurnal cycle of downwelling atmospheric radiation lagged behind that of upwelling longwave radiation. The daily amplitude of surface net radiation in winter in the Ali area was less than in other seasons, as expected, and the seasonal transformation had a great impact on the net radiation for this region. The net radiative energy at the surface was highest in late spring and early summer, which played a decisive role in the formation of terrestrial and atmospheric heating.