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Boundary layer observational analyses and study on the climatic effects in the Hengduan Mountain area.

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The data, which have been continuously observed for three years with the atmospheric surface layer turbulent flux observation system set up with the help of the JICA Project of Sino-Japan Cooperation Research Center of Meteorological Disaster on the underlying surface of farmland in Dali in the south section of the Hengduan Mountain area, are used to analyze and compare the characteristics of diurnal and seasonal variation of land surface-atmosphere sensible heat and latent heat exchange flux at Dali National Climate Observatory. The comparison with the result of NCEP/NCAR reanalysis indicates that there is an obvious difference between the observed result and the mode reanalysis result. A mode simulation tool is used to analyze and study the possible reason of the regional diabatic heating abnormal variation, based on which the possible effect of the land surface-atmosphere flux exchange abnormality in this sensitive region on the spring rainfall climate in south China is compared and analyzed as well. The result shows that one main reason for the surface diabatic heating abnormal variation in spring and summer in the central south section of the Hengduan Mountain area is the variation of the surface vegetation. Lack of understanding such variation and its effect is a key factor affecting the improvement of the accuracy of weather and climate numerical model prediction and forecast in this region and downstream areas.