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Seasonal characteristic features of local circulation at a Himalayan valley near Mount Everest

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For obtaining seasonal variation information of local circulation features and deeper understanding of wind system mechanism of the Rongbuk valley on the northern slope of Himalayas near by Mount Everest, Global Position System (GPS) radiosonde system was launched on June, 4-11, August, 20-26 and November, 22-28 in year 2014, which are considered to be the pre-monsoon, monsoon and non-monsoon periods respectively. Additionally, the wind profiler (WP) and radio acoustic sounding system (RASS) measurements were operated to observe the vertical structures of local wind system from May to August, 2014. Meanwhile, the surface wind data obtained from three different sites located at 4276m,5190m and 5830m above sea level in the Rongbuk valley are used to discuss the possible different glacier wind effect in different parts of Rongbuk Valley. Substantial findings include the existence of weak nighttime upslope flows during monsoon caused by the air temperature difference in the valley and the downward momentum transport from westerlies to surface wind during winter. During pre-monsoon, there are two circulations dominate the entire valley, e.g. mountain-valley wind system and glacier wind system, before about 16:00 Beijing Standard Time (BST).