

The isotopic composition of water vapor and the concurrent meteorological conditions around Qiyi glacier in Northwest China

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The stable isotopic ratio of water vapor ($\delta^{18}\text{O}$ and δD) around the Qiyi glacier in Northwest China was investigated. Atmospheric water vapor sample at Qiyi glacier (Qiyi, 39.15.22N, 97.45.14E, 4250m) and base camp (BC, 39.16.35N, 97.42.50E, 3672m) from 11 August 2003 to 17 August 2003 was analyzed. Then the temporal change of the isotopic composition was compared with the atmospheric circulation fields derived by ECMWF objective analysis dataset. Clear difference of isotopic composition of getting heavier δD and higher d-excess value from the evening of 14th to mid day of 16th was identified with a deep trough observed at 500 hPa level and dry air from the northwest.

We also found the diurnal change of δD and $\delta^{18}\text{O}$, with getting lighter and lighter value from the noon to the evening. It corresponds to the observed northerly valley wind from the noon to the late evening and it is speculated that more atmosphere from northern desert with the valley wind in the afternoon to the evening played a role with the diurnal variation.

Figure caption

open circle: valley wind at BC

open triangle: valley wind at Qiyi

closed circle: mountain wind at BC

closed triangle: mountain wind at Qiyi

cross (in the lower panel): d-excess of the observed snow at Qiyi

