



Change of cloud amount and its possible contribution to the climate warming on the Tibetan Plateau

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An especially strong surface air temperature increasing in night and winter features the recent climate warming on the Tibetan Plateau. By using historical observations at 71 meteorology stations in the period of 1961-2003, here we show that the *in situ* nocturnal total cloud amount has decreased but lower cloud amount increased substantially. Because the lower cloud accounts for about 60% of the total nocturnal cloud amount, the increased lower cloud restrained long wave radiation cooling and in favor of nocturnal climate warming. On the hand, both the diurnal total and lower cloud amount exhibits a decreasing trend. It resulted in absorbing more solar radiation in day and in favor of diurnal climate warming, too. However, since the variation amplitude of nocturnal cloud amount is larger than day, it helps to diminish the diurnal temperature range. To seasonal average, the variation trend of lower cloud amount was un conspicuous, and the decreasing amplitude of total cloud amount presents larger in winter than summer. It is propitious to receive more solar radiation and stronger climate warming in winter. In addition, the weakened winter monsoon also strengthened the climate warming to a certain degree.