

Dissipating behavior of the Martian low-latitude cloud belt

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Besides the importance of dust, recent studies also suggest the importance of water ice/vapor, which had not been paid attention to during the post-Viking era. Among many phases of water, the polar caps and the low-latitude cloud belt play the most important roles. Although we already have close knowledge of the low-latitude cloud belt, many mysteries still remain. One of them is its dissipating behavior.

In the 2001 apparition, we observed Mars at Steward Observatories of Arizona University. The Martian season during the observational period is northern late summer/early autumn, which observations were suited for the study of the dissipating behavior.

Here we present our results on this issue, also using our observations in 1997 and 1999. The cloud belt did not significantly change its latitudinal dimension until its dissipation. This suggests that the cross-equatorial Hadley circulation did not change its latitudinal dimension. Moreover, the cloud belt had significant longitudinal structure. This suggests that the cross-equatorial Hadley circulation should longitudinally localize, which has also been suggested on Earth recently.

The next apparition is 2003. Mars will then be in southern summer, when we expect dust storms, which dominate the Martian climate, in particular, the atmospheric thermal structure. We plan to investigate the properties of dust particles using HOPS (Hida Observatory Polarimetry System). Furthermore, the spacecraft "Nozomi" will approach Mars after that. We expect fruitful observations complementary with preceding ground-based observations.