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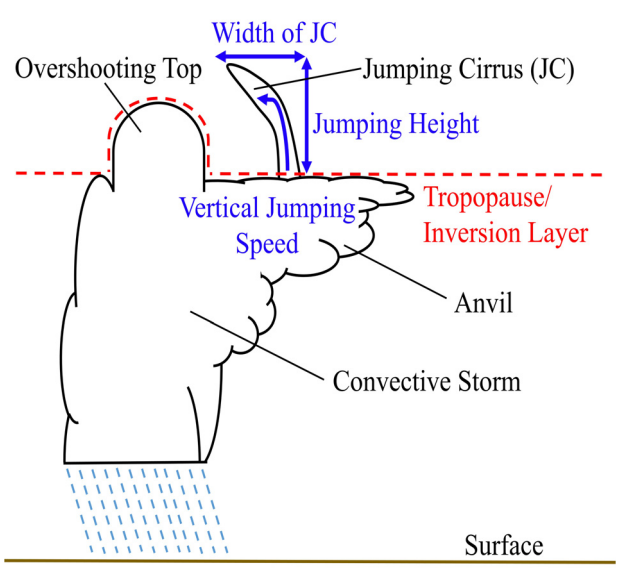
Plain Language Summary: This is the first study where jumping cirrus (JC), a cirriform cloud which literally jumps up and drifts away at the top of anvil of deep convective clouds, is analyzed based on the observation with ground-based visible cameras. Combined with a star chart, infrared band of Himawari-8, and radiosonde, JC's size, timescale, and environmental atmosphere were investigated for 14 cases during the summer in the Kanto area, Japan. The results showed that even if the underlying convection is relatively weak, JC can occur and 3 cases of JC entered the lower stratosphere. JC is likely to moisten the lower stratosphere by sublimation and contribute to the estimation of stratospheric water vapor.



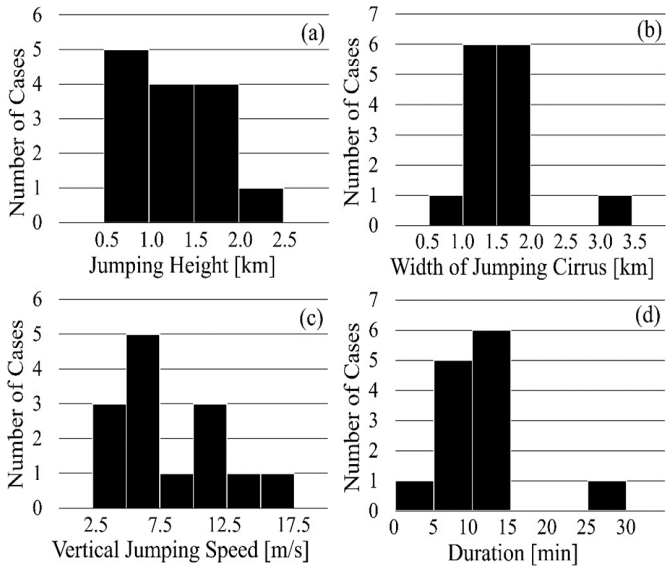


Figure 1 (left). Schematic diagram of JC. JC occurs after an overshooting top sinks down to the anvil. It drifts for a while and disappears above the anvil by partial sublimation. If the anvil reaches the tropopause, JC can transport substances into the lower stratosphere.

Figure 2 (right). Frequent distribution of the calculated JC parameters for 14 cases. On average, the jumping height was 1.3 km, the width was 1.6 km, the vertical jumping speed was 8.0 ms^{-1}, and the duration to disappear was 641 seconds. These values are consistent with the model study of the US case.

- Compared with the US case reproduced by a model simulation, the JC's height, vertical speed, and duration shows similar scales.
- On the other hand, all the cases occurred from relatively smaller cumulonimbus which stems from smaller convective available potential energy (CAPE).
- There was no correlation between JC parameters and environmental atmospheric parameters.