



Punching Holes in the Sky United States

In December 2009, the Landsat 5 satellite observed this extraordinary example of “hole-punch clouds” over West Virginia. This strange phenomenon results from a combination of cold temperatures, air traffic, and atmospheric instability.

If you were to look from below, it would appear as if part of the cloud were falling out of the sky. As it turns out, that is actually what is happening. The clouds are initially composed of liquid drops at a super-cooled temperature below 0° Celsius. As an airplane passes through a cloud, particles in the exhaust can create a disturbance that triggers freezing. Ice particles then quickly grow at the expense of water droplets. Eventually, the ice crystals in these patches of clouds grow large enough that they literally fall out of the sky, earning hole-punch clouds their alternate name: “fallstreak holes.”

In this false-color image, pink and faint blue areas are typical water-rich clouds, and bright cyan areas are ice clouds. The hole-punch areas appear dark around the ice clouds.