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Conference on European Tornadoes and Severe Storms

A photographic documentation of European tornadic thunderstorms

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Tornadoes are rarely observed with European thunderstorms. This may have several reasons. Tornadoes might be less frequent than in other parts of the world (e.g., the U.S.). It is, however, also possible that tornadoes remain unobserved, partly due to a reduced visibility (hilly orography, clouds), partly because people do not know where and when to look at the sky. Wind damage associated with thunderstorms is often concentrated on narrow strips such that tornadoes cannot be excluded as a source of the damage.

It is therefore of interest to document thunder-clouds with a potential to produce tornadoes. In this contribution, we show photos of thunderclouds that were responsible for heavy wind damage on one hand, and that were clearly rotating based on Doppler radar measurements. One case is documented in detail. It's a storm from 2 June 1999. On that day, a cold front passed over Switzerland and southern Germany. Heavy thunderstorms with hail, floods and heavy wind developed along the front. >Several people were injured, and the damage on crops, cars and buildings was more than 15 Millions Euro. A strong supercell storm in advance of the front produced heavy hail over the city of Basel in northern Switzerland and continued to propagate in direction NE, i.e. towards the Black Forest in Southern Germany. At about 16 h a funnel cloud not reaching the ground was clearly visible >in that storm. The funnel cloud was observed for about 15 seconds and had a quick and twirling counterclockwise rotation. Doppler radar data from the ETH-radar confirm that a mesocyclone of about 4 km in diameter was present at that time in the storm (see contribution by Schmid et al., this volume).

We conclude that specific signatures of rotating thunderclouds (wall cloud, black cloud shreds, rotating motions) are often visible by eye. Such signatures are precursors of funnel clouds and damaging tornadoes.

