A supercell thunderstorm with damaging wind and large hail in Finland

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During the late afternoon and evening of 28 June 2009, a supercell thunderstorm moved over central eastern Finland. The storm moved from north to south causing vast damage during its over 5 hour life time. The hail was up to 8 cm in diameter and downbursts caused F1 wind damage with two injuries.

A unique observational material of the event was collected, including 33 hail reports, 18 wind damage reports from Emergency Response Center and the public as well as several photos of both hail and damage. Additionally, aerial photographs of the wind damage taken from low-flying aircraft were available, and photographs of the visual appearance of the thunderstorm at different stages of storm development were obtained from storm spotters. The material includes also a unique video footage of starting downburst and gustnadoes over a lake.

The storm passed close to the Kuopio Doppler-radar, which allowed detailed analysis of storm development and its features during and before severe weather. The radar analysis showed supercell features as mesocyclone, bounded weak echo region and a persistent hook echo. Collapsing reflectivity cores were observed prior to the major downbursts. The storm went through a mesocyclone occlusion during its lifetime and its structure resembled a hybrid storm with characteristics of both supercellular and multicellular storms.

This presentation offers an analysis of storm development and a comparison of the reflectivity structures with both the visual appearance and the observed severe weather. Furthermore, the usefulness of a new large hail nowcasting tool and hail algorithm is tested.