

2.32 TORMIC: RADAR-BASED DETECTION AND FORECASTING TORNADOES AND MICROBURST OVER NORWAY

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Core objectives of the Norwegian Meteorological Institute (MET Norway) are providing weather forecasting and warnings to ensure that the public and stakeholders are best able to protect life and property, have reliable information for planning and environmental protection. Forecasting extreme wind and precipitation events are a high priority task. Tornadoes and microbursts have a high impact on safety and decision making. The occurrence of tornadoes and microburst in Norway are infrequent and are mainly concentrated in the southern regions. Climate changes imply that the amount of these events will increase with time. The project “TorMic - (radar-based) forecasting of tornadoes and microbursts over Norway” is investigating how to set up warnings of these phenomena.

Tornadoes and microbursts are convective phenomena. The convection on a synoptic scale can be forecasted in advance by state-of-the-art numerical weather prediction (NWP) models on the basis of the available data a day or two before. However, convection on a local scale of few kilometers is characterized by a limited predictability in time. Thus frequent data assimilation cycles, every one hour or so, would be needed to properly represent thunderstorms within NWP. A radar-based method and nowcasts are widely used to monitor the evolution of heavy precipitation events over the next few (1-2) hours and can be used to detect the occurrence of hail and mesocyclonic rotation. In this context, the TorMic-project aims at implementing a mesocyclone and tornado detection algorithm based on radar observations. For this we will try to adapt existing mesocyclone and tornado detection algorithms to fit the Norwegian environmental conditions. The method will be evaluated over selected case studies extracted from the archived radar observations, moreover a dedicated scan on a mobile X-band radar placed at the Oslo airport will be operated during the summer of 2018 to test the best radar setup targeted to our purposes. TorMic is a part of a local project at MET-Norway, that aims to give new methods in forecasting of extreme weather events. The project focus on Norwegian meteorological and environmental conditions, nonetheless we believe that the outcomes would be relevant also for other countries with a similar climate.
