18–22 September 2017, Pula, Croatia
ECSS2017-128


# The use of a Semi-automated Severe Convection Checklist at MeteoSwiss Forecast Offices

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## Introduction/Motivation

Switzerland and the Alpine region are subject to a wide range of convective modes spanning the entire thunderstorm spectrum from airmass thunderstorms to supercells. In order to better anticipate the convective mode and virulence of upcoming convective events, MeteoSwiss has developed a severe convection checklist. This normalized checklist, operational since 2011, is ingredient-based and meant to aid weather forecasters in better anticipating potentially severe convection and help them in their decision making process regarding the issuance of severe thunderstorm outlook and watches.

## Methods

The checklist is broken down into four main key ingredient categories which, in turn, are composed of specific meteorological parameters/indicators chosen to quantify each ingredients contribution to the overall convective threat. Specific thresholds have been applied to each meteorological parameter based on local climatology and are used to help determine how present each ingredient is and hence what the overall severe convective risk is for a specific region and time of day. Each parameter and range of values are attributed different weights as a function of their estimated overall importance in contributing to the severity of the storms expected. This checklist methodology theoretically allows a forecaster to distinguish between slightly severe and significantly severe convective events, depending on the final normalized value obtained after filling it out. Since 2011, the checklist has undergone some tuning and has migrated from paper form to an XML based intranet format. For efficiency purposes, the checklist was semi-automated in 2016 and included as a macro layer on our NinJo visualization platform. This was undertaken in order to speed up its calculation since filling it out manually for several different micro-climate regions within the heterogeneous Alpine terrain was just not feasible timewise in an operational setting.

## Results/Conclusions

Six years of operational implementation of the checklist has allowed forecasters to access its overall utility which has been deemed globally beneficial. It has helped introduce a more objective method amongst forecasters to anticipate a given day's severe convective risk and is instrumental in the forecaster's decision making process in issuing severe thunderstorm watches. Verification results tend to show that the checklist performs really well during high CAPE / high shear events but regionally exaggerates the convective risk for low-lying regions during high CAPE / low shear events. Other interesting results will be presented regarding the checklist's performance in the heterogeneous Alpine terrain and possible explanations given which should help spur its future tuning.