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Characteristics of the linearly organized convective systems over Croatia

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Linearly organized convective systems, usually referred to as squall lines, frequently cause heavy rain, strong winds, intense lightning, hail and consequently flash flooding. In the Pannonian basin squall lines are a frequent cause of severe weather events and can result in large material damages. We investigated squall lines above continental part of Croatia, focusing on their appearance and the synoptic and thermodynamic environment in which they form. Using archive radar and lightning data, we isolated 50 linearly organized convective systems during 8 convective seasons (2010-2017) and grouped them into types, according to the appearance in radar images. The most active year was 2017 and June was the most active month, in average. The most frequent type was the one with trailing stratiform precipitation. Satellite images were also analyzed in order to investigate cloud-top signatures of the storms. The most common surface synoptic situation in which linearly organized convective systems occurred was a relatively short lasting low pressure center above Croatia. Analyzing 500 hPa pressure surface, we saw that most of cases developed on the leading side of a trough, in the presence of southwesterly flow regime. To assess the thermodynamic conditions prevailing at the time of squall-line formation we calculated CAPE by lifting three different air parcels: a surface based, a mixed layer parcel and the most unstable parcel, as well as bulk shear 0-1, 0-3, 0-6 km and bulk Richardson number from the radiosounding data measured at Zagreb-Maksimir radiosounding station. The results of the analysis will be presented.