

Title: Overview of the first HyMeX Special Observation Period over Croatia

Authors: Ivančan-Picek et al.

RECOMMENDATION: Minor revisions

The high impact events occurred over Croatia during the first HyMeX SOP are discussed in this interesting paper, which nicely summarizes the outcomes and lessons learned from the participation of DHMZ in HyMeX. The paper is appropriate for NHESS, thus I recommend its publication after some relatively minor modifications.

Anyway, I strongly recommend that the authors should improve two points. First, I think the text would definitely benefit from a serious proof-read by a native English-speaker. Second, the organization of the paper should be improved. Actually, the reader may have troubles following the description of the different IOPs, since the authors jump from one figure to another and it is difficult to follow the information flow (this is true in particular for Subsection 3.1). The improvement I ask for is necessary for a better readability of the paper in order to convince the interested reader that is worth to read until the end. With this purpose, it may be convenient also to reduce the length of the manuscript and, possibly to remove some figure panels.

Minor points:

Line 139-141: I think it would be beneficial to add the locations of radiosounding stations and radar sites in Fig. 2;

Line 144: ... majority...: how many?

Line 152: The dense network of climatological stations ....: how many? What is the horizontal resolution of the network?

Line 153: why are the synoptic observations not taken at the main synoptic hours?

Lines 165-167: It is not clear what SAP refers to: is it a technique to select relevant parameters?

Line 199: why is the convection parameterization employed at 2 km grid spacing? Why not using an explicit treatment?

Subsection 2.3.1 is too long and provides unnecessary details; it should be strongly reduced;

Line 218: what is the biperiodization?

Line 312-316: the details about NAO are unnecessary since it is a well-known index;

Line 364: where is Rijeka? A map with the location of the places mentioned in the text should be added (maybe using Fig. 2);

Lines 390-391: sentence not clear;

Line 434: add a sentence like “Especially in a narrow and inhomogeneous basin like the Adriatic, small-scale SST variations cannot be properly represented in the coarse large-scale analysis, especially near the coasts”;

Line 459: “...less **than** or equal **to** 0.2 ...”; is this calculated in each grid point?

Line 471-499: the statistical analysis requires the definition of the indices used in Tables 2 and 3; this could be done in an Appendix;

Section 4: since the Section is completely dedicated to IOP2, it may be convenient to add the reference to Miglietta, M. M., Manzano, A. and Rotunno, R. 2016. Characteristics and Predictability of a Supercell during HyMeX SOP1. Q.J.R. Meteorol. Soc., doi:10.1002/qj.2872, which focuses on the convective episodes of IOP2 over northeastern Italy;

Figure 6: it seems like ARPEGE has a systematic bias in SST: what is its resolution?

#### Other points:

Line 53: rephrase in this way “... data assimilation especially at the convective scale. HyMeX ...”;

Line 55: ...responsible **for** their ...

Line 95: ... on the **southeastern** part of ...

Line 99: ... expanded **to** the Adriatic ...

Line 125: including -> included

Line 192-193: ... the operational **forecasting system** (Tudor et al., 2013). At **that** time ..., run twice per day on a domain **with 8 km grid spacing** (Fig. 1a)

...

Line 266: ... **an** additional operational forecast run ...

Line 286: 0000 UTC instead of 0600 UTC;

Line 300: rephrase “Similar results were found over the Apennines in the Italian peninsula ...”

Line 309: “as a favorable condition to ...”

Line 367: “Occasionally, a mesoscale cyclone **developed**, associated with ...”;

Line 367: do you refer to low or upper level PV anomaly?

Line 369: “**The** mesoscale cyclone moved ...”

Line 373: “over southeast coast of the Adriatic **in Croatia** ...”

Line 378: “This weather regime (**Fig. 3b**) ...”

Line 383: “Smooth troughs (**Fig. 3c**) entering ...”

Line 384: “a **southwesterly low-level**(?) flow over the Adriatic TA”

Line 397: “A **southwesterly** flow (**Fig. 3f**) ...”

Line 398: “... that formed **between** northwest Europe **and** northern Africa ...”

Line 402: “... orographically forced ...”

Line 410: “A mesoscale cyclone or a frontal system **moving** slowly southeastward ...”

Line 413: “... southeast Adriatic coast **of Croatia** and ...”

Line 436: "... the SST decreased **by 10°C in the station of Bakar ...**"

Line 442: "... the simulation **with modified SST** is more realistic (**cf. with Figure 6b**) ..."

Line 445: "... improvements **due to** the role ..."

Line 498: IOP9 or IOP19?

Line 518: "...southwesterly flow...";

Lines 524-526: "During **late afternoon** ... resulted **in** intensive convective processes..."

Line 534: "a more" instead of "the more";

Lines 541-543: "... in more than thousand ... belong to the category of extraordinary rare events ... expected once in forty ..."

Line 573: "data ... are shown ...": really, they are not shown;

Line 589: "... jet streams ...";

Line 592: "(not presented)"; really, they are actually presented, but the caption does not describe these panels;

Line 594: "... NE LLJ (bora wind), modified and intensified by the pressure gradient, across ...";

Line 613: "The **line of** upward motion moves ...";

Line 615: "...permanent **uplift** over ...";

Line 625: "...**the** most intense precipitation ...";

Line 655: "...selected cases...";

Line 658: remove additional (repetition); "...seems **a** good way...";

Line 669: "Maximum precipitation **was** ... recorded ..."

Line 688: remove "now";

Line 690-692: "... since the scores are based on point comparison, thus it is prone to location and other errors based on ..."

Line 694: "... but, for this, local spatial precipitation ..."

Line 712: "...**a** factor ..."

Line 729: "... in that region. **Results** suggest ..."

Line 733: "interactions. IOP4 ..."

Line 745: "... processes **that** caused ..."

Figure 3 caption: "...**at** 1200 UTC..."

Figure 7 caption: "... greater than or equal to ... frequency of dry days for a given period ..."

Figure 9 caption: "Hourly precipitation ..."

Figure 13 caption: "Red colors are used for locations in Istria peninsula".