

Review of the paper:

Multi-sensor analysis of convective activity in Central Italy during the HyMeX SOP 1.1

by:

N. Roberto et al.

General comment

This paper shows a multi-sensor analysis of convective precipitation events that occurred over Central Italy in fall 2012, during the HyMeX SOP1. More in detail the observations of a C-Band Radar in South Rome, a 2-D video disdrometer located in the Rome centre and the strokes recorded by the LINET network are used together to investigate several aspects of the convection occurred in three main convective episodes in Central Italy. In general the paper is interesting and well developed. There are, however, some points that the authors should consider.

Major points

- 1) In the paper the terms stroke and lightning are somewhat confused. The authors consider all analysis performed in the paper using the strokes of the LINET network. At the same time they refer and compare their results with works using lightning. Some grouping of the strokes must be performed to compare the results of this paper with findings in other works (see for example Yair et al., 2014).
- 2) One of the interesting findings of this paper is the linear correlation between the graupel ice water content and the lightning activity. The linear correlation coefficients, however, are rather different between the 15 October case study and the other two cases considered (12 October and 13 September). The authors discuss this difference also in light of the findings of Formenton et al. (2014). I suggest to correlate the graupel IWC with the lightning number (not the stroke number) to see if there is a better agreement among the cases.
- 3) I found several errors in the paper (sometime typesetting errors, sometime English error, etc.). A careful and thorough review of the paper must be done to avoid as much as possible those errors.

Yair, Y., Shalev, S., Erlich, Z., Agrachov, A., Katz, E., Saaroni, H., Price, C., Ziv, B, 2014. Lightning flash multiplicity in eastern Mediterranean thunderstorms, *Natural Hazards and Earth System Sciences* 14, 165-173. doi:10.5194/nhess-14-165-2014

Minor points

Page 9247 line 19: the acronyms (IWC) must be introduced the first time they appear in the paper.

Page 9252 line 21: 0° level is 0°C level. Sometime you wrote 0°C, sometimes 0 deg, sometime 0°. Please uniform.

Page 9252 line 22: "Main rainfall activity were located..." few lines above it is stated that the event involved mainly NE Italy, while Naples is to the South. Explain. Also review the English.

Page 9254 line 9: Fig. 2e-g should be Fig. 2d-f. Check.

Page 9254 line 20: "the night"

Page 9255 line 2: "move" should be "moved".

Page 9255 line 21: there are more than 11 strokes in Fig. 4. Check.

Page 9258 line 19: 0° -> 0°C. Also throughout the paper.

Page 9258 line 28. "Concerning" starts a new paragraph here.

Page 9260 line 27-28. The point (ii) is not clear because it is unclear from where the authors draw this conclusion. A better explanation of this result is necessary.

Page 9261 line 4: RSDs is repeated.

Page 9261 line 7: I cannot see any coloured circle in Figure 9. Moreover, the colour legend is missing.

Page 9261 line 26: "the 15 October" -> "on 15 October", also the following line.

Page 9270: Pruppacher and Klett bibliography. The year is wrong.

Page 9274 : Table 4 caption "obtaned"->"obtained".

Page 9281: "Optimezed" both legend and graph. Moreover change "0 deg" with "0° C".

Page 9283: Figure caption: "between for" -> "on".

Page 9285: Figure 9 caption. "According to Baldini and Gorgucci (2006)".