

**We would like to thank the referee for the accurate review of our manuscript and for the comments that help to greatly enhance the paper. In the revised version of the manuscript, we have increased the conclusions, as requested, in particular by inserting a commented summary of the results. Below we list our replies to the specific comments**

Specific comments

1. Pag. 2050, line 26: '... because the climate change..'. According to the references, in this categorical sentence any term may be included to indicate probability or relationship between these events and climate change rather than cause and effect.

**The text was rewritten. The two sentences were separated, as follows:**

***"In recent decades because of climate change, both violence and the frequency of torrential rain events (i.e.,  $> 64 \text{ mm d}^{-1}$ ) are increased (Alpert et al., 2002), despite the decrease of the annual rainfall in the Mediterranean basin (Piervitali et al., 1998). Analysing rainfall patterns, Lionello et al., 2006, have highlighted a huge spatial and temporal variability of precipitation in the Mediterranean basin. In Italy, Brunetti et al. (2004) detected a significant decrease in both annual precipitation and annual number of wet days, and an increase in the precipitation intensity. Working at regional scale, Brunetti et al. (2012) found a significant negative trend of total annual precipitation in Calabria (southern Italy) over the period 1923-2006. With regard to the monthly total precipitation, they detected a general negative trend, albeit not everywhere significant, for the autumn–winter period, and a slight increase in the summer total precipitation."***

2. Pag. 2054, line 10: Please, give some details on these three regions.

**A brief description of the three regions were included.**

***With regard to annual maxima of high-intensity and short-duration rainfall, Versace et al. (1989) delimited three homogeneous rainfall regions in Calabria, including: (i) a Tyrrhenian region (25.8% of the region) along the western Tyrrhenian coast, (ii) a Central region (44.3%), comprising the mountain ranges along the main divide, and (iii) an Ionian region, along the eastern Ionian coast (29.9%). They found that the Tyrrhenian rainfall region is characterized by more frequent and less severe rainfall events than the Ionian rainfall region, whereas the Central rainfall region has events with intermediate characteristics.***

3. Pag. 2054, line 18: This paragraph can be reduced.

**The paragraph was reduced, as follows:**

***"The main part of Calabria is characterized by a typically Mediterranean climate (Csa - Hot-summer Mediterranean climate) in Köppen's (1948) classification, with dry and hot summers and low average temperatures. The remaining portions (inland and not vallive areas) are classified as Csb, or Cfb, or Cfa (Warm summer Mediterranean, or Maritime Temperate, or Humid subtropical climate, respectively - cfr. Iaquina and Terranova, 2010).***

***As an average, temperature features of Calabria are summarized as follows: (i) the annual values range from 10°C on the mountain slopes to 18°C along the coast; (ii) August is the hottest month and January the coldest; (iii) the daily values may exceed 40°C in July and August; (iv) January presents 10°C along the coasts and 4°C in the mountains; (v) values below 0 °C may often occur on Sila and Aspromonte (Terranova et al., 2009)."***

4. Pag. 2055, line 20-23: Please define abbreviations Denv and Ej .

**We defined the symbols  $D_{EV}$  and  $E_j$ , as duration and energy of the rainfall events, respectively.**

5. Pag. 2057, line 5: Spells out information 'several times'.

**The number of exceedances of the threshold value was added (903).**

6. Pag. 2061, line 11: Would be interesting to complete the information about the BSC

***A better description of the method for determining BSC and a more comprehensive explanation of figure 2 were added to the text in Section 4.***

***In the brackets was added the text “as reported in figure 2”.***

***The text was modified as follows:***

***“More precisely, a 4-digit binary shape code, BSC, was determined, as follows: the generic k-th ( $k = 1, 2, 3, 4$ ) threshold was defined corresponding to the area  $A_k^*$  underlying the four quarter of the uniform SRP:***

***$A_k^* = \frac{1}{2} \tau_k^2 - A_{k-1}^*$ , with  $A_0^* = 0$ , and  $\tau_1 = 0.25, \tau_2 = 0.50, \tau_3 = 0.75, \tau_4 = 1$ . The analogous four values of the area***

***$A_k$  underlying the generic SRP were compared to  $A_k^*$  obtaining the Binary Shape Code,  $BSC = S1S2S3S4$ ,***

***based on the logical condition: if  $A_k > A_k^*$ ,  $S_k = 1$ ; vice versa  $S_k = 0$ . As a result, a binary shape code, BSC, was associated to each SRP. The informative content expressed by the BSC is more complete than that expressed by Huff’s quartiles. BSC describes the profile as a whole, while Huff’s quartiles describes only a quarter of duration, but does not depict the rest of the profile.”***