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## North Atlantic SST variability and high impact storms affecting the Iberian Peninsula

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The Iberian Peninsula has experienced on recent years an increasing number of high impact cyclones (e.g. Klaus, 23-24 January 2009 and Xynthia, 27-28 February 2010; Liberato et al. 2011; 2013) associated with extreme precipitation events, flooding and damage to infrastructure. Recent examples are cyclones Elsa and Fabien, on December 2019, which forced more than 250 people to be evacuated from their homes in Mondego region villages, in central Portugal, due to rising river waters and infrastructure disruption .

However until now not enough evidence has been gathered to confirm a general and significant increase in the frequency and intensity of these events in the north-eastern Atlantic. In fact, according to Karremann et al. (2016) the maximum in recent years is comparable to other stormy periods in the 1960s and 1980s, suggesting that their frequency of occurrence undergoes strong multi-decadal variability.

In this study a high impact extratropical cyclones dataset developed in the framework of project “WEx-Atlantic - Weather Extremes in the Euro Atlantic Region: Assessment and Impacts” is used to assess the variability in frequency and intensity of these events over the last decades in the Iberian Peninsula. A ranking of daily precipitation days for the Iberian Peninsula taking into account not only the area affected but also its average intensity (Ramos et al. 2014) is also used. Additionally, a spatio-temporal variability of sea surface temperature (SST) is performed in the North Atlantic, using ECMWF ERA5 reanalysis data for the period 1979-2019. Finally the relevance of the North Atlantic SST variability on the intensity of these extreme events affecting the Iberian Peninsula on recent winter seasons is discussed.

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### References

Karremann et al. (2016) *Atmos. Sci. Let.*, 17: 354-361 DOI: 10.1002/asl.665

Liberato et al. (2011) *Weather*, 66: 330-334 DOI: 10.1002/wea.755

Liberato et al. (2013) *Nat. Hazards Earth Syst. Sci.*, 13: 2239-2251 DOI: 10.5194/nhess-13-2239-2013

Ramos et al. (2014) *Atmos. Sci. Let.*, 15: 328-334, DOI: 10.1002/asl2.507