



## **A nine-year climatology of thunderstorm days and lightning characteristics in Basque Country.**

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Traditionally, thunderstorm activity is recorded at meteorological sites as a number of thunder-days (TD) per year. A thunder day is defined as an observational day during which thunder is heard at the station. Despite the fact that today instrumental records of lightning incidence based on different automatic systems are available in many parts of the world, it is still useful for different purposes to have information about the TD. In this paper we use different approximations for TD calculation, based on data from Lightning Detection System available in the area (part of LINET Network) and we check impact on results obtained.

We present a TD climatology for the Basque Country including lightning characteristics during 2010-2018 period. Monthly, seasonal and annual frequency distribution of TD and their temporal and spatial variations are analyzed for the Basque Country area. We also study daily lightning characteristics and determine how lightning characteristics vary between different TD types. We include daily statistics for relevant lightning parameters as TL, CG, CC, polarities and intensities. In such way we can examine relationships between lightning activity in the framework of a multi-year climatology of TD.

In this study, an attempt has been made to understand the temporal and spatial variation of thunder days and lightning characteristics in Basque Country. Results shows an annual cycle with the highest number of TD during summer time (particularly in June and July) and a minimum during winter (particularly in December and January). Spatial patterns are very different during summer and winter time. While during November, December, January and March maximum TD are produced in cantabric basin near the sea shoreline, during June, July, August and September maximum TD are displaced to the Southeast interior part of the territory.