

## **Abstract**

**Martina Lagasio, "Lightning flash activity indices as forecasting tool of high impact weather events over complex topography", 2015.**

Flash floods are one of the most dangerous meteorological hazards and their number is rapidly rising in the last years. As a result, it becomes very important to improve the forecast of these high impact weather event. In order to improve the present forecast capabilities, many studies reveal the relationship between lightning phenomena and rainfall evolution in thunderstorms, so the relevance of lightning prediction is becoming in the last decades more clear, however, the actual capability to forecast the potential for lightning occurrence in short-range forecast is still low. In this thesis, the Lightning Potential Index (LPI) developed by Lynn and Yair in 2010 is studied, implemented and its performances are evaluated through the application on the weather forecast model output in seven different case studies. This index formulation is based on the actual lightning physics knowledge.