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# GWT18 air circulation types linked to heavy precipitation in Romania between 1980 and 2009

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The goal of this study is to analyse the correlation and causality between air circulation types as per the GWT18 Catalogue of COST733 project, and heavy precipitation events in Romania over a 30-year interval starting on January 1st, 1980. The evolution of the frequency of such events over the three decades in this interval has also been investigated. A hybrid spatial domain has been therefore used with Romania at its center, for creating centroids corresponding to each of the circulation types. Discerning correlation and causality would be useful in further assessing the heavy precipitation hazard that would be generated by certain types of circulation over a year. A number of 874 days with heavy precipitation and 2545 surface observations on precipitation amounts have been used in the analysis. We have found that, over the entire reference interval, there are three circulation types (5, 13 and 17) that are standing out of the whole set, that were most frequently associated with heavy precipitation in Romania. In addition, the role of upper-level air circulation in connection with these GWT18 types was revealed, for cases of extreme events.