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Heavy precipitation episodes and cosmic rays variation

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Abstract. In this paper an attempt is made to investigate the possible temporal correlation between heavy precipitation episodes and cosmic rays' activity, on various time scales. Cosmic rays measurements are sparse and cover less extended periods than those of precipitation. Precipitation is largely influenced by local climatic and even physiographic conditions, while cosmic rays' distribution is far more uniform over an area. Thus, in an effort to cover a larger range of climatic characteristics, each cosmic rays station was correlated with several nearby precipitation stations. Selected statistical methods were employed for the data processing. The analysis was performed on annual, seasonal, monthly and daily basis whenever possible. Wet and dry regions and/or seasons seem to present a different response of precipitation to cosmic rays variations. Also Forbush decreases in most cases will not lead to heavy precipitation, yet this might be sensitive to precipitable water availability.

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