315
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Title:Atmospheric propagation at 100 and 300 GHz: Assessment of a method to identify rainy conditions during radiosoundings
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Abstract:The influence of atmospheric gases and tropospheric phenomena becomes more relevant at frequencies within the THz band (100 GHz to 10 THz), severely affecting the propagation conditions. The use of radiosoundings in propagation studies is a well established measurement technique in order to collect information about the vertical structure of the atmosphere, from which gaseous and cloud attenuation can be estimated with the use of propagation models. However, some of these prediction models are not suitable to be used under rainy conditions. In the present study, a method to identify the presence of rainy conditions during radiosoundings is introduced, with the aim of filtering out these events from yearly statistics of predicted atmospheric attenuation. The detection procedure is based on the analysis of a set of parameters, some of them extracted from synoptical observations of weather (SYNOP reports) and other derived from radiosonde observations (RAOBs). The performance of the method has been evaluated under different climatic conditions, corresponding to three locations in Spain, where colocated rain gauge data were available. Rain events detected by the method have been compared with those precipitations identified by the rain gauge. The pertinence of the method is discussed on the basis of an analysis of cumulative distributions of total attenuation at 100 and 300 GHz. This study demonstrates that the proposed method can be useful to identify events probably associated to rainy conditions. Hence, it can be considered as a suitable algorithm in order to lter out this kind of events from annual attenuation statistics.
Number of references:33
Main heading:Rain gages

Controlled terms:Gages
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