



DIPARTIMENTO DI SCIENZE STATISTICHE
"PAOLO FORTUNATI"

Statistics Seminars 2018

Thursday 25 October from 2 to 4 pm
Seminars room – Department of Statistical Sciences, first floor

“Experimental Design for Cloud Seeding”

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Abstract: The 2018 Atlant rainfall enhancement trial in Oman will be the six-th of a scheduled six-year sequence of trials running since 2013, and will be conducted in the Hajar Mountains of Oman from June to October. Atlant is a ground-based cloud ionisation system that is assumed to enhance the microphysical processes of precipitation formation at multiple stages resulting in an increase in the amount of rainfall on the ground downwind of the emitter. Specifically these apparatus aims to enhance raindrop growth and hence is dependent on rain-bearing convective clouds suitable for enhancement. Such conditions are frequent during the months of the trial in the Hajar mountains. The aim of the six years of trials is to produce statistically reliable data about the efficacy of Atlant for such an enhancement effect in this region of Oman. This statistical evaluation is based on a randomized experimental design with strict operational controls, as opposed to opportunistic cloud measurements, and an extensive set of surface level rainfall measurements and supporting meteorological observations. Statistical modelling and analysis of rainfall data is notoriously difficult because of the huge variability associated with, where and when rainfall occurs. However, such a trial is possible for a ground-based system with a well-defined downwind target area such as Atlant, provided there are sufficient rainfall gauges spread over this area and adequate care is taken when analysing the data obtained from these gauges to account for the spatial and temporal variability in rainfall. The basic objective of this sequence of rainfall enhancement trials is then to identify whether variation in the operation of the Atlant systems leads to statistically significant differences in rainfall in the defined area of interest, i.e. downwind of these systems when they are operational.

Organized by
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