OCCULTATION SCIENCE AND APPLICATIONS IN EUROPE: THE CONTRIBUTION AND ROLE OF ESA

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The presentation will review the contributions of the European Space Agency (ESA) in initiating and developing occultation projects, carried out in cooperation with the European scientific community and space industry. Past optical and radio occultation projects will be briefly reviewed, with an emphasis on the application of the GNSS radio occultation technique, for which the substantial European development efforts in the areas of mission analysis and simulation, instrumentation, performance evaluation and retrieval methods will allow reaching soon operational maturity, particularly in the context of the MetOp mission. Present and near-future efforts will be described, with an emphasis on:

- the definition of enhanced or new instrumentation, such as the GRAS-2 instrument for GNSS radio occultation and the equipment for microwave inter-satellite links at frequencies close to the 22 GHz water vapour absorption line,
- the importance of the on-going development of the European satellite navigation system GALILEO, which is expected to enhance the scientific and operational return of radio occultation missions quantitatively as well as qualitatively,
- the planned ESA occultation missions, such as the Atmosphere and Climate Explorer (ACE+) mission recently selected as the top priority Opportunity Mission in the ESA Earth Explorer line devoted to research and demonstration of new observation techniques.