

SCIENTIFIC ACHIEVEMENTS of the SMOS MISSION

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ABSTRACT:

In November 2009 the SMOS satellite was launched. SMOS is based on a two D L band (1400 1427 MHz) interferometer covering the globe twice in less than 3 days. Shortly after launch, the first global maps of soil moisture ever measured from space were produced. Since then, the achieved accuracy has continuously improved to match the requirements. The long term trends of surface moisture can now be closely linked to precipitation regime, and SMOS results have been successfully used in response to extreme events. In parallel, even though more challenging, the first sea surface salinity maps were also produced and there also, ocean salinity results have also improved dramatically. Very quickly several amazing results were obtained over land and oceans ranging from river plumes or fresh water pools monitoring to hurricane tracking over the oceans, weather forecast improvements and flood and droughts monitoring, to name only a few. Moreover, new applications have been imagined in various fields such as of sea ice thickness, or freeze thaw maps. The most severe issue encountered was linked to illegal man made emission (Radio frequency interferences) which hampered somewhat the first results but is not better under control. This presentation will give an extensive status of the mission, emphasizing the many lessons learned and demonstrating some of the outstanding science results, as well as synergistic approaches with other missions. Some perspectives on the mission and future missions will also be given. A particular emphasis will be given on new level 4 products currently being produced as well as comparisons with other existing sensors.

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