Geophysical Research Abstracts
Vol. 13, EGU2011-13697, 2011
EGU General Assembly 2011

The New generation OF SMOS satellite and Synergisms with SMAP

Yann Kerr (1), Bernard Rougé (1), Guy Lesthievent (2), François Cabot (1), Eric Anterrieu (3), and Olivier Merlin (1)

(1) CESBIO, Toulouse Cedex 4, France (Yann.Kerr@cesbio.cnes.fr/ +33 561558664), (2) CNES, 18 avenue E Belin, 31401 Toulouse CEDEX, France (guy.lesthievent@cnes.fr), (3) IRAP CNRS UPS, France (eric.anterrieu@obs-mip.fr)

The SMOS (Soil Moisture and Ocean Salinity) satellite, launched in November 2009 as part of the ESA's (European Space Agency) Earth Explorer Opportunity program aims at providing soil moisture over land and ocean salinity over oceans. The SMOS concept relies on a 2D interferometer operating at 1.4Ghz (wavelength of 21 cm). Pasive microwaves at L band being the best way to monitor soil moisture in a quantitative fashion.

SMOS was designed with specifications elaborated in the early 90's and is tuned for meteorologicaland climate applications, as well as extreme event mitigation.

It now appears that a sytem having all the same characteristics but a significantly improved spatial resolution is required to start addressing other important issue related to water ressources management and coastal monitoring, possibly with an improved sensitivity.

SMOS designed cannot do that as it is optimised for the concept and if gains can be made, they would be small and at a significant cost. So as to solve this issue, dis-agregation techniques have been tested. They work up to a factor 5-8 but not for all cases and with a degradation of the signal. Consequently, though very promising, they do not fit th ebill completely.

Having an in depth knowledge of SMOS it was relatively easy to find another technical approach solving this issue and we have now a design which enables to gain a factor 10 in terms of spatial resolution (i.e. 4 km spatial resolution, very comparable to SMAP after disaggregation) with a system still tractable in space. Using disagregation techniques could bring the SM field within the km range resolution which would make such a mission a really innovating tool.