Fire damage assessment in Sardinia: the use of ALOS/PALSAR data for the management post fire affects

Nicolas Mari (1,2), Giovanni Laneve (3), Enrico Cadau (4), Pablo Marzialetti (1,3)

(1) Instituto Gulich - Comisión Nacional de Actividades Espaciales, Centro Espacial Teófilo Tabanera,Córdoba, Argentina, (2) Instituto de Clima y Agua - Instituto de Nacional Tecnología Agropecuaria (CIRN-INTA), Hurlingham, Buenos Aires, Argentina, (3) Universita di Roma "La Sapienza", Centro de Ricerca Progetto San Marco, Roma, Italy, (4) Serco S.p.A. Frascati (RM), Italy

Wild fires in the Sardinia island are one of the most important environmental controls affecting the ecosystems functioning and structure. In the last years, the increase of fires frequency and size, has led to enormous damage of the forest stands, with the consequent alteration of landscape patterns and biomass loss. Post fire evaluation by means of remote sensing is economically and practically the best way to assess fire effects, before going to the field. The use of optical sensors has led to efficient techniques to retrieve burned scars, as the use of thermal sensors for fire detection and monitoring. Nevertheless, the ongoing predictions about an increasing fire activity in the Mediterranean region, represent a big challenge to the fire fighting community, as to the government institutions in charge for the environmental control. In this context, the use of alternative techniques to asses fire effects are needed, in particular to characterize the biomass loss at the regional level. Even if an extensive literature has demonstrated the possibility of obtaining accurate burned area mapping by using optical sensors it would be interesting to investigate the possibility of using Radar systems as a possible way to maximize the capacity of assessing the biomass loss in Mediterranean ecosystems. In fact, radar remotely sensed data which are not affected by phenomena such as water vapour, smoke or clouds can provide great advantages with respect to optical sensors. In particular, the paper is devoted to show the results obtained by applying a semi-automatic algorithm to the images of the L-band SAR (PALSAR) sensor, on board of the Japanese satellite ALOS, for the estimate of the burned area. To assess the quality of the estimate the radar based results will be compared with those obtained by processing optical data and ground based information.