Geophysical Research Abstracts,
Vol. 10, EGU2008-A-08472, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-08472
EGU General Assembly 2008

High resolution COSMO/SkyMed SAR data analysis for flood damage detection: the pilot project Opera

G. Boni (1), F. Castelli (2), L. Ferraris (1), N. Pierdicca (3), B. Serpico (4), F. Siccardi (1), C. Versace (5)

(1) CIMA Foundation, Italy, (2) DICEA - Univ. of Florence, Italy, (3) DIE - University "La Sapienza", Rome, Italy, (4) DIBE, University of Genova, Italy, (5) Cos(OT) industrial consortium, Matera, Italy

The methodological approach and the general scheme of an integrated system for the better use of Earth Observation (EO) data in the Italian organization for civil protection from flooding events, is presented here. The system is critically based on the use of remote sensing and especially Cosmo/SkyMed (C/S) data: a prototype is being implemented in the context of the pilot project OPERA, funded by ASI. The main target of the prototype consists in a quantitative comparison of the performances of systems for the prediction of flooding risk with and without the proper use of the EO and especially C/S data available by the next five years. The main novelties of the system are represented by the possibility to exploit satellite data to generate estimates of the saturation state of the soil, at different space and time scales, to observe the state of rivers and water bodies, and to detect flooded areas, in any weather and illumination condition. Remote-sensing data analysis is involved in several processing phases, i.e., the generation of land-use/land-cover maps by image classification methods, the production of change maps by change-detection techniques, or the use of digital-elevation-models (DEMs) for basin characterization. The work focuses on the advantages in the use of remotely sensed imagery in the context of flooding-event prevention and management and by describing the set of image processing and analysis techniques being involved. Specifically, on a set of selected critical Italian basins, supervised image classification methods are exploited in the proposed system in order to generate LU/LC maps of the basins at different resolutions. Similarly, change-detection methods are used in

the proposed system in order to perform a post-event identification of the flooded areas and of the ground changes. Both the change in backscattering coefficient and the phase coherence properties of multitemporal SAR imagery can be exploited to detect changes. Experimental examples are described in order to anticipate possible results generated by the proposed system.