

1. Record Nr.	UNINA9910367751603321
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Titolo	Microwave Indices from Active and Passive Sensors for Remote Sensing Applications / Simonetta Paloscia, Emanuele Santi
Pubbl/distr/stampa	MDPI - Multidisciplinary Digital Publishing Institute, 2019 Basel, Switzerland : , : MDPI, , 2019
ISBN	9783038978213 3038978213
Descrizione fisica	1 electronic resource (224 p.)
Soggetti	Geography
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Sommario/riassunto	Past research has comprehensively assessed the capabilities of satellite sensors operating at microwave frequencies, both active (SAR, scatterometers) and passive (radiometers), for the remote sensing of Earth's surface. Besides brightness temperature and backscattering coefficient, microwave indices, defined as a combination of data collected at different frequencies and polarizations, revealed a good sensitivity to hydrological cycle parameters such as surface soil moisture, vegetation water content, and snow depth and its water equivalent. The differences between microwave backscattering and emission at more frequencies and polarizations have been well established in relation to these parameters, enabling operational retrieval algorithms based on microwave indices to be developed. This Special Issue aims at providing an overview of microwave signal capabilities in estimating the main land parameters of the hydrological cycle, e.g., soil moisture, vegetation water content, and snow water equivalent, on both local and global scales, with a particular focus on the applications of microwave indices.