A Complex of Polarimetric, Combined Active-Passive Sensors of L-, C-, and X-Band of Frequencies for Vessel and Airborne Application

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Abstract: A complex of polarimetric (dual polarization), combined active-passive devices of L-, C-, and X-band of frequencies for land and sea surface microwave reflective and emissive characteristics simultaneous and coincident measurements is presented. The complex is dedicated to solve the problem applied to near sea surface wind and surface wave fields' parameters precise and unambiguous retrieval, as well as for sea surface signatures detection and identification. The methodology of experiments' performance and field calibration will be discussed. The results of preliminary measurements of sea surface radar backscattering coefficients and brightness temperatures under various conditions of observation (angle of incident, location and polarization), air-water temperatures, wind and wave parameters will be presented. Relationships between sea surface radar backscattering coefficients, brightness temperatures, statistical characteristics of radar signal frequency's distributions and the parameters of observed media will be built. As well as correlative properties between fluctuations of sea radar backscattering coefficients, radar signal frequency distribution characteristics and brightness temperatures due to the change of sea surface principal parameters air-water temperatures, wind speed and direction, sea wave force and swell condition will be presented. Vessel and airborne application properties of such a complex application for sea surface mapping will be discussed.