THE SIR-C/X-SAR SURFACE HYDROLOGY EXPERIMENT IN BRAZIL: REPORT AND PRELIMINARY RESULTS

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ABSTRACT

The SIR-C/X-SAR Mission is finally taking off on April, 7, 1994. The Shuttle will fly for about 10 days carrying aboard a multiparameter Synthetic Aperture Radar System: Three bands (L, C and X), four polarizations for L and C bands (HH,VV, VH, HV), one for X Band (VV) and incidence angles ranging from 15^{0} to approximately 60^{0}. Spatial resolution is a good as 6 meters. Processed and calibrated data in 16 looks are to be released to Principal Investigators within two months from the experiments. The Bebedouro Irrigation, in the São Francisco River Valley (semi-arid region of northeast Brazil, Pernambuco state) was selected as a supersite for surface hydrology to the mission. The Bebedouro project which size is around 700 ha, is managed by the federal government's Brazilian Enterprise for Agricultural Research, EMBRAPA, with its Center for Agricultural Research for the Semi-arid, CEPATSA. The goals include the development of an algorithm to extract soil moisture from radar images, to couple radar measurements to a soil-atmosphere interface water and energy exchanges model, in order to obtain estimates of evapotranspiration at regional scale, and to verify the capability of radar to discriminate among agricultural crops grown up there. "In situ" measurements include soil, vegetation and other ancillary data. More specifically for soil daily sampling of moisture for the first 5 and 10 cm layers of the soil surface (about one 100 samples a day), soil profile humidity down to 100 cm (before the first data take opportunity), soil texture and soil characteristic curve (once, by the mission timing); for vegetation field measurements will include Leaf Area Index, state, type, density and height. Ancillary data will be date and depth of irrigation and routine meteorological data. We intend to present here the report of the report of the experiment concerning this particular study as well as the preliminary results. A second flight is now scheduled for August 1994.