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Assessing the energy balance over flooded rice cultivation in Southern Brazil

D. Roberti (1), L. G. Gonçalves (2), A. Comin (1), C. Martins (1), O. Moraes (1), and O. Acevedo (1)

(1) Dpto Fisica, Universidade Federal de Santa Maria, Santa Maria, RS, Brasil (debora.roberti@pq.cnpq.br, alcylawless@yahoo.com.br, cintyaam@yahoo.com.br, osvaldo.moraes@pesquisador.cnpq.br, acevedo@pesquisador.cnpq.br), (2) ESSIC-University of Maryland / Hydrological Sciences Branch-GSFC-NASA, Greenbelt, MD, USA, (luis.g.degoncalves@nasa.gov)

Flooded rice cultivation is a common practice in Southern Brazil, region responsible for approximately 50% of the national production with 1100 hectares. However, over these regions, in particular during the flooded cultivation, water, carbon and energy dynamics are still poorly understood. In this work the energy balance is analyzed over a flooded rice crop located in Southern Brazil (29.744S; 53.15W) using one year data set (26jun 2003 –26jun2004). A flux tower was assembled in the rice field and energy related fluxes to the atmosphere were obtained using eddy covariance techniques. Ground heat flux was also measured using probes. The above-ground water depth was not measured during the field experiment therefore the energy stored in water was not computed as part of the energy balance.

The results during the flooded period (October to February) show that when the soil is saturated and the Leaf Area Index (LAI) starts to increase as a result of the crop grow, the energy balance is less than the surface radiation budget by approximately 20%. During the remaining months (non-flooded period) there is no significant difference between the energy balance and surface radiation budget. A correction factor is suggested to take in account the differences during the flooded periods. For this particular region the correction factor is found to be 1.2.