



Estimation of surface albedo in the Brazilian Amazon using high spatial resolution satellite imagery

Gabriel de Oliveira (1), Elisabete Caria Moraes (2), Yosio Edemir Shimabukuro (3), and Thiago Veloso dos Santos (4)

(1) National Institute for Space Research, Remote Sensing Division, Brazil (gdo@dsr.inpe.br), (2) National Institute for Space Research, Remote Sensing Division, Brazil (bete@dsr.inpe.br), (3) National Institute for Space Research, Remote Sensing Division, Brazil (yosio@dsr.inpe.br), (4) University of Minnesota, Department of Soil, Water and Climate, United States of America (dossa013@umn.edu)

The Amazon region has been focus of attention due to the effects that large-scale deforestation can cause on local, regional and global climate. Several field experiments have been conducted in this region to obtain information related to energy exchange between land surface and atmosphere. However, these experiments are concentrated in a few test sites due to the high cost involved in the data acquisition. The present study aimed to estimate the surface albedo under different land use and land cover types (primary tropical forest, secondary succession forest, pasture, rough pasture, bare soil and natural/artificial waterbodies), using data from Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER), onboard the Terra satellite, for an area located in the south-western part of the Brazilian Amazon. ASTER/Terra images, referring to the product of surface reflectance (AST07XT), were used and the surface albedo was calculated according to the algorithm developed by Liang (2001). The estimates of surface albedo were in agreement with values found in other studies using orbital data in similar land use and land cover types. Moreover, surface albedo values obtained for homogeneous areas of primary tropical forest and pasture were consistent with meteorological studies performed under these conditions in the Amazon region. The proposed methodology allowed to estimate and to analyse the surface albedo in the Amazon with a fine spatial resolution (15 m), that may work as an alternative methodological approach for studies related to the biosphere-atmosphere interaction in this region.