MONTHLY LAND SURFACE TEMPERATURE MAPS OVER EUROPE USING ADVANCED ALONG TRACK SCANNING RADIOMETER DATA FOR 2007.

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1. INTRODUCTION

Land Surface Temperature (LST) monthly maps are needed in order to perform climatological studies. Remote sensing is the most feasible tool for obtain these maps. In this work we used the Advanced Along Track Scanning Radiometer (AATSR) data in two ways: Using the LST product (Prata, 2002) and using the algorithm proposed in Galve et al. (2008) in nadir view.

2. METHODOLOGY

LST product of AATSR is based in the split-window method with a set of coefficients depending on the land use classification. This product depends on vertical column water vapor content and the zenith angle of view (Prata, 2002). The algorithm proposed in Galve et al. (ASWn, 2008) has been used as alternative algorithm in this work. This algorithm was based in the Coll and Caselles (1997) split-window model and depends explicitly on emissivity and path column water vapor content. This algorithm has been validated in the Valencia test site (Coll et al. 2005; Galve et al. 2008) and the results show that the error of this algorithm in this site is ±0.5 K.

With both algorithms we perform LST maps over Europe. We used a 0.05º pixel size grid from 72° N – 11° W to 35° N – 42° E. The emissivities needed to the alternative algorithm were obtained from MODIS land surface temperature and emissivity product (MOD11, Wan and Li, 2008) due to the similarity between the MODIS and the AATSR 11 μm and 12 μm bands. The path column water vapor was obtained from the NCEP Global Tropospheric Analyses product.

3. ASSESSMENT

In order to evaluate the quality of the maps we resampled these to 1° pixel size to compare these with the LST from the NCEP Global Tropospheric Analyses product. The most similar algorithm with NCEP LST is the ASWn with a difference lower than ± 2 K. Regarding the maps obtained from AATSR LST product the difference was close to ± 3 K.

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