

空间物理学★大气物理学

利用ENVISAT/AATSR资料反演黄土高原陇东地区地表温度

张堂堂<sup>1</sup>,文军<sup>1</sup>,Rogier van der Velde<sup>2</sup>, 刘蓉<sup>1</sup>,刘远永<sup>1</sup>

1 中国科学院寒区旱区环境与工程研究所西部气候与环境灾害实验室, 兰州 730000

2 International Institute for Geo-information Science and Earth Observation (ITC), 7500 AA Enschede, the Netherlands

收稿日期 2008-9-25 修回日期 2008-11-6 网络版发布日期 2009-4-20 接受日期

**摘要** 由于ENVISAT/AATSR资料不同角度热辐射亮度值之间存在较高的相关性从而导致较大误差的产生, 本文尝试避开这种误差源, 只选取天底观测数据对黄土高原陇东地区整层大气水汽含量及地表温度进行反演. 与MODIS整层大气水汽含量产品对比验证表明, 本文结果与MODIS产品有一定差异, 但是可以直接用于大气透过率的估算. 结合野外观测数据对地表温度反演结果的检验表明, 最大绝对误差为4.0 °C, 平均相对误差为5.0%, 因此, 该算法在黄土高原陇东地区应用比较成功.

**关键词** [地表温度](#) [AATSR](#) [反演](#) [MODIS](#) [黄土高原](#)

分类号 [P407](#)

DOI: [10.3969/j.issn.0001-5733.2009.04.007](#)

Land surface temperature retrieval using ENVI SAT/AATSR data over east Gansu of Loess Plateau

ZHANG Tang-Tang<sup>1</sup>, WEN Jun<sup>1</sup>, Rogier van der Velde<sup>2</sup>, LIU Rong<sup>1</sup>, LIU Yuan-Yong<sup>1</sup>

1 Laboratory for Climate Environment and Disasters of Western China, Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, Lanzhou 730000, China

2 International Institute for Geo-information Science and Earth Observation (ITC), 7500 AA Enschede, the Netherlands

Received 2008-9-25 Revised 2008-11-6 Online 2009-4-20 Accepted

**Abstract** As the high correlation among the multi-angle thermal radiances can result in large errors, in this paper, only ENVISAT/AATSR nadir data are used to estimate total atmospheric water vapor content and land surface temperature over east Gansu of Loess Plateau instead of using both nadir and forward data. Comparing the result of the retrievals with MODIS total atmospheric water vapor content products, a little difference was found between the AATSR retrievals and MODIS products, but the retrieval of water vapor content is acceptable and can be directly used in deriving atmospheric transmittance. Land surface temperature retrievals are also validated by using the ground measurements, the maximal absolute error is 4.0 °C, the average relative error is 5.0%, which indicates that the estimation is successful in the Loess Plateau.

**Key words** [Land surface temperature](#); [AATSR](#); [Retrievals](#); [MODIS](#); [the Loess Plateau](#)

通讯作者:

文军 [jwen@1zb.ac.cn](mailto:jwen@1zb.ac.cn)

作者个人主页: 张堂堂<sup>1</sup>;文军<sup>1</sup>;Rogier van der Velde<sup>2</sup>; 刘蓉<sup>1</sup>;刘远永<sup>1</sup>

### 扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF](#) (2473KB)

▶ [\[HTML全文\]](#) (0KB)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [引用本文](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中 包含“地表温度”的 相关文章](#)

▶ 本文作者相关文章

- [张堂堂](#)
- [文军](#)
- [Rogier van der Velde](#)
- [刘蓉](#)
- [刘远永](#)