Temporal Dual-polarization SAR Crop Classification Based on Coherence Optimization

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Polarized synthetic aperture radar (PolSAR) can obtain rich feature information by receiving electromagnetic waves from different features at different polarization combinations, and is widely used in fields such as feature classification. The coherence of multi-temporal polarization SAR data is a useful supplement to polarization SAR data, which contains information that is not available in single phase polarization data. This paper aims to introduce temporal coherence analysis into dual polarization data information and coherently process SAR images acquired at different times in the same region, so as to effectively combine the information of both time dimension and polarization dimension and improve the accuracy of crop classification of Sentinel data. In order to fully extract the changes of feature in the time dimension, this paper obtain the distinction and connection of each category in temporal features by using the multi-temporal feature information of SBAS. Based on multi-temporal polarization SAR coherence optimization, Sentinel-1 data is used for experimental analysis and verification. Data were collected from the time series dual-polarization data of Yucatan Lake area from April to September 2019. The effects of different polarization states on the characteristics of crop species is explored and the classification effects of the optimized values of coherence features is analyzed.

基于相干性优化的时序双极化 SAR 农作物分类

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极化合成孔径雷达（PolSAR）通过接收不同地物在不同极化组合下的电磁波，可以获得丰富的地物信息，被广泛应用在地物分类等领域。时序极化 SAR 数据的相干性包含了单时相极化数据所没有的信息，是极化 SAR 数据的有益补充。本文旨在把双极化数据信息中引入时序相干性分析，将同一地区的不同时间获取的 SAR 图像进行相干性处理，从而有效结合时相和极化两个维度的信息，提升 Sentinel 数据农作物分类的精度。为了充分提取地物特征在时间维度上的变化，本文利用 SBAS 的多时序特征信息可以获得每个类别在时序特征中的区别和联系。从多时相极化 SAR 相干性优化的基础上，利用 Sentinel-1 数据开展实验分析验证。数据采集自 Yucatan Lake 地区 2019 年 4 月至 9 月的时序双极化数据。探讨不同极化状态下对农作物种类特征的影响，分析相干特征优化值的分类效果。