MODIS/NDVI和MODIS/EVI在耕地信息提取中的应用及对比分析

Application of MODIS/NDVI and MODIS EVI to extracting the information of cultivated land and comparison analysis

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中文摘要：

MODIS植被指数数据是区域土地利用信息提取的重要数据源。为了对比MODIS两种主要植被指数（NDIV、EVI）在耕地信息提取中的应用，采用通过时间序列谐波分析法（Harmonic Analysis of Time Series，HANTS），对2006年全年MODIS 16天250m的NDVI和EVI时间谱数据进行了重构，从而进行了河西走廊绿洲中东部样区一系列耕地信息的提取实验，包括耕地、休耕地识别以及耕地复种指数、作物种类提取。在此基础上，对MODIS的NDVI与EVI数据的应用进行了对比分析。结果显示：（1）利用傅立叶谐波变换得到的EVI和NDVI时间谱曲线的谐波余项及谐波振幅对耕地进行识别，从识别精度来看，EVI要优于NDVI，识别精度分别为97.17%和 95.99%，Kappa系数分别达到0.7938和0.6518；（2）通过计算时间序列曲线的波峰数能够提取耕地的复种指数，并且在EVI和NDVI曲线波峰阈值分别设为0.20和0.25时，休耕地能较为准确地被识别出来；（3）通过提取作物生长期内曲线的VI最大增长速率时间点以及峰值时间点等信息，作物种类能被初步识别，并且EVI较NDVI具有更强的识别能力。

英文摘要：

MODIS vegetation index is one of the important data for extracting the information of cultivated land. In order to compare the application of the two critical vegetation indexes (NDVI/EVI) in the information extraction, the authors took Oasis in Hexi Corridor Region as experimental area, reconstructed the MODIS/EVI and MODIS/NDVI(16 day, 250m) time series in 2006 in the test area by HANTS(Harmonic Analysis of Time Series). Then, the cultivated land and fallow land were identified; multiple cropping index and the type of the crop were extracted. Based on those, the behaviors of MODIS/EVI and MODIS/NDVI were compared. Results indicate that: (1) by using HANTS, the researchers could get the EVI/NDVI harmonic curves, the mean VIs and the amplitude of the harmonics which then were utilized in the identification of the cultivated land, and EVI appeared to be more precise, with the overall accuracies of 97.17% and 95.99% and Kappa coefficients of 0.7938 and 0.6518, respectively. (2) Multiple cropping index was extracted by counting the number of the curve’s peak; and when the threshold of the peak value of the NDVI and EVI curves were set as 0.25 and 0.20, respectively, the fallow land could be well figured out. (3) From harmonic curves, some eigenvalues, such as time of the maximum growth rate, time of peak and the value of peak can be extracted, based on which the crop types can be primarily distinguished. And EVI still performed better than NDVI in this section.

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