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英文题目: Comparison of the Global Energy Cycle with Chinese ReAnalysis Interim (CRAI) and ERA5 Datasets

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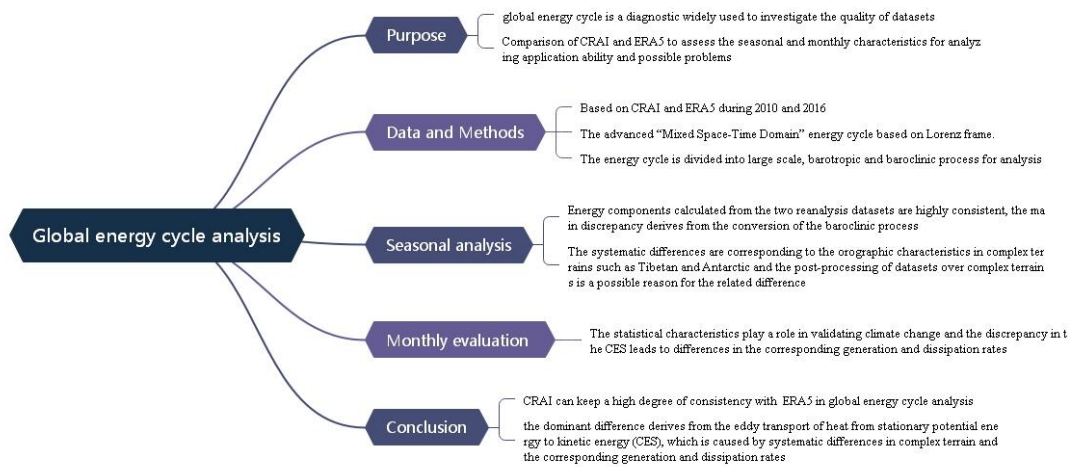
英文摘要: The global energy cycle is a diagnostic widely used to investigate the quality of datasets. In this study, the “Mixed Space-Time Domain” energy cycle is evaluated using newly developed datasets (i.e., the Chinese ReAnalysis Interim (CRAI) and the ECMWF (European Centre for Medium-Range Weather Forecasts) ReAnalysis version 5 (ERA5) over a 7-year period (2010-2016) for seasonal and monthly analyses. The results show that the energy components calculated from the two reanalysis datasets are highly consistent, and some energy components in the global integral from the CRAI are slightly larger than those from the ERA5. The main discrepancy in the energy components derives from the conversion of the baroclinic process, whereas the dominant difference derives from the eddy transport of heat from stationary potential energy to kinetic energy (CES), which is caused by systematic differences in temperature and vertical velocity at low- to mid-latitudes in the Northern Hemisphere and near the Antarctic, where there is complex terrain. From the monthly analysis, the general discrepancy in the time series mainly derives from the CES and corresponding generation and dissipation rates.

中文题目: 中国全球再分析资料 (CRAI) 与 ERA5 全球能量循环比较

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全球能量循环方法广泛应用于资料质量诊断评估,本文中混合时空域能量循环方法被应用于新开发的中国全球再分析资料与 7 年的 ECMWF 所开发再分析资料 ERA5 的比较中 (2010-2016),用于考察季节及月尺度差异。结果表明两种再分析产品所计算的能量高度一致,部分 CRAI 产品有所偏高。主要差异来源于斜压过程转换项 CES,这主要是由于复杂地形条件下温度及垂直速度处理所导致的系统性误差引起。由月尺度分析表明,差异主要来源于 CES 及能量源汇。

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