Session: C23 Poster: T214B

The challenges of producing Climate Data Records from satellite microwave radiometers

Frank Wentz[†]; Carl Mears
[†] Remote Sensing Systems, USA
Leading author: frank.wentz@remss.com

For several decades, satellite microwave (MW) radiometers have been observing a number of key climate variables including tropospheric temperature and sea ice (since 1979), atmospheric moisture (vapor, cloud, rain) and sea-surface wind (since 1987), and sea-surface temperature (since 1998). These sensors have provided the most definitive evidence to date that the arctic sea ice is declining and the troposphere is both warming and moistening. This talk focuses on the challenge of inter-calibrating these MW radiometers at the sensor level and then producing consistent climate data records (CDR). In total, there are 184 satellite years of observations that need to be consistently processed in order to provide the community with reliable climate information. Sensor related issues such as spacecraft pointing and attitude errors, emissive antennas, sun intrusion into hot loads, and long-term stability will be discussed along with the MW radiative transfer model and the associated retrieval algorithms. We will describe a holistic approach to CDR generation that considers all aspects of the problem, including sensor calibration, geophysical retrievals, and product validation. Climate trends from different satellites will be compared to assess the reliability of the trend estimates.