Soil Moisture Retrieval Test over The West of China by Use of AMSU Microwave Data

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Outline

1. Drought Detecting
2. Surface Microwave Emissivity Retrieval
3. Surface Soil Moisture Retrieval
1. Drought Detecting

Surface Wetness Index of AMSU-A:

\[ AI = \frac{Tb2 - Tb3}{Tb2 + Tb3} \]

\[ Y = 255 \times \frac{I - I_{\text{min}}}{I_{\text{max}} + I_{\text{min}}} \]

The Map of Surface Wetness Index of AMSU-A over China.
Drought Analysis Results at The Last Ten Days of July over The South of China

A: Severe Drought,  B: Moderate Drought
C: Light Drought,  D: Normal
E: Water Body,  F: Data Gap
2. Surface Microwave Emissivity Retrieval

The percentage of bare soil in one AMSU-A pixel retrieval from the data base of IGBP.

1: desert, 2: snow cover, 3: water body, 4: The percentage of bare soil in one AMSU-A pixel.
Surface Emissivity Retrieval Results by Using of AMSU-A Data

AMSU-A ch3(50.3GHz) (2002.4.20~2002.4.30)

Desert
3. Surface Soil Moisture Retrieval

Surface moisture information in regional scale over the West in 2001.5 was retrieved by use of semi-empirical method based on the results of surface microwave radiance forward simulation. In the simulation, two kinds of situation, with canopy and no canopy, were involved at the AMSU-A window channels frequency points. Good results were got after comparing with surface region analysis result and point observation data.
Surface Moisture Information by Using of AMSU-A Data

(Volural Percentage 2002.4.20 4.30)
Controlled Analysis of AMSU-A Retrieval and Surface Observation
(Round Dots is for bare soil; Rhombic dots is for wheat field.)
1. AMSU-A window channels are sensitive to regional surface wetness, and can be used for drought detection;

2. Surface Moisture Information can be Retrieved by Using of AMSU-A data, and would become a new data source for surface application, such as drought analysis, sand storm analysis, et al.