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

Gu Songyan[1] [2] Qiu Hong[1] [2] Zhang Wenjian[2]
[1] (Physical Institute of Peking University Beijing P.R.C. 100871)
[2] (CMA NSMC Beijing P.R.C. 100081)
ITSC-14，2005

Outline

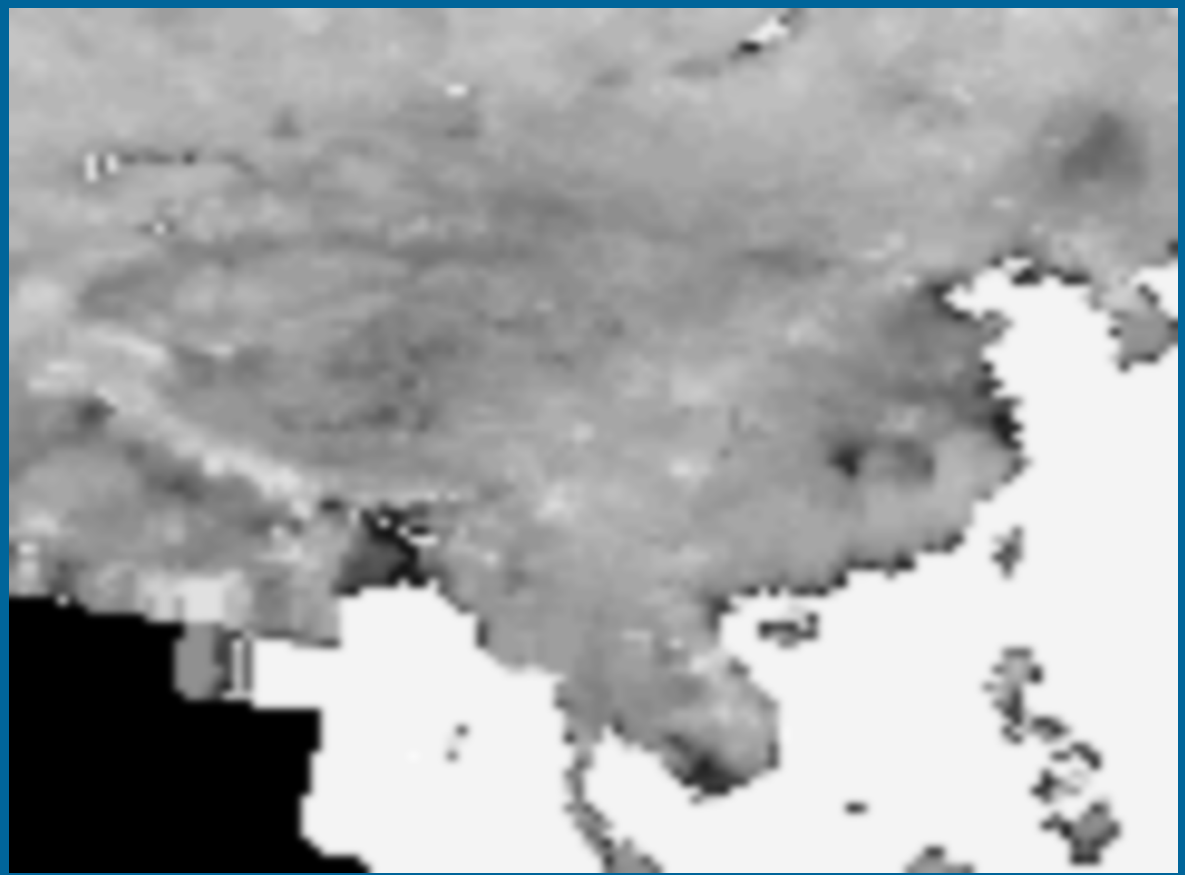
1. Drought Detecting
2. Surface Microwave Emissivity Retrieval
3. Surface Soil Moisture Retrieval

1. Drought Detecting

Surface Wetness Index of AMSU-A:

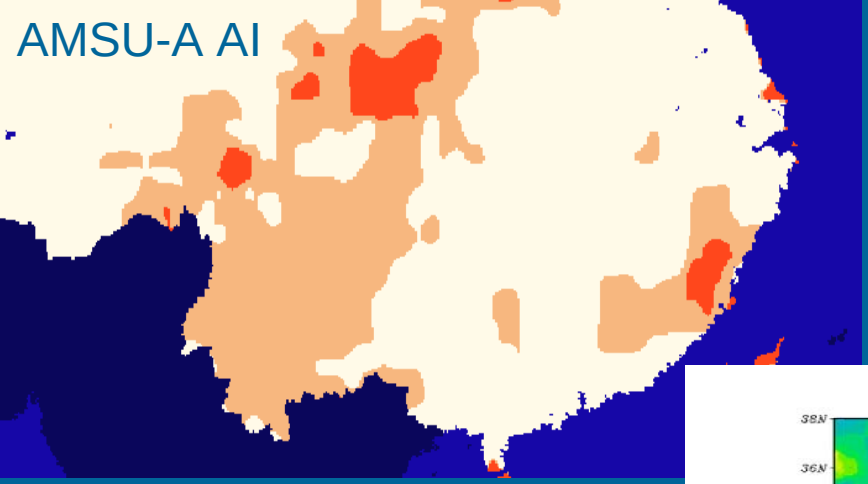
$$AI = \frac{Tb2 - Tb3}{Tb2 + Tb3}$$

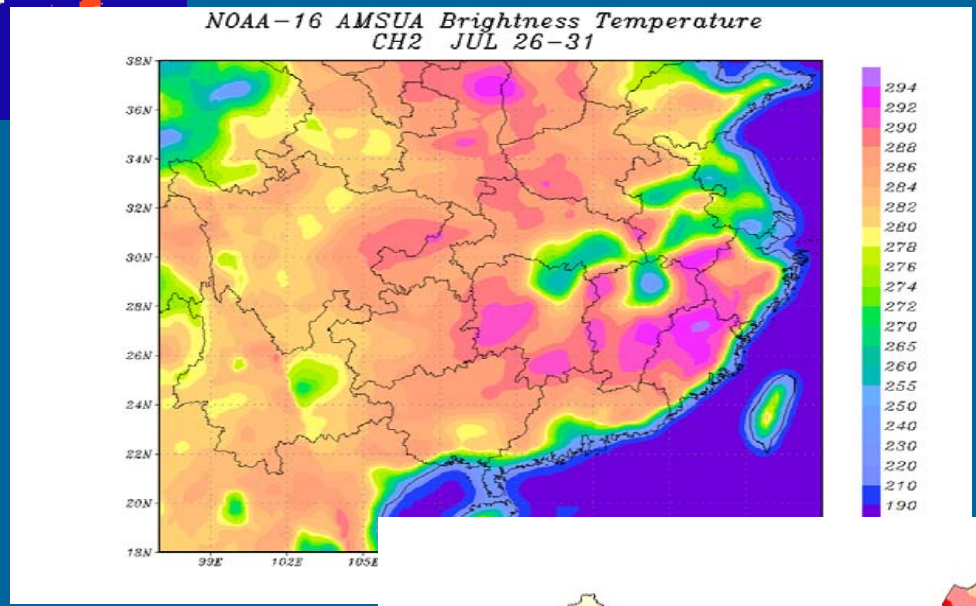
$$Y = 255 * \frac{I - Imin}{Imax + Imin}$$

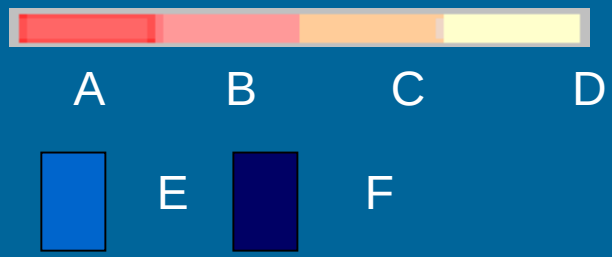


The Map of Surface Wetness Index of AMSU-A over Chin

Drought Analysis Results at The Last Ten Days of July over The South of China



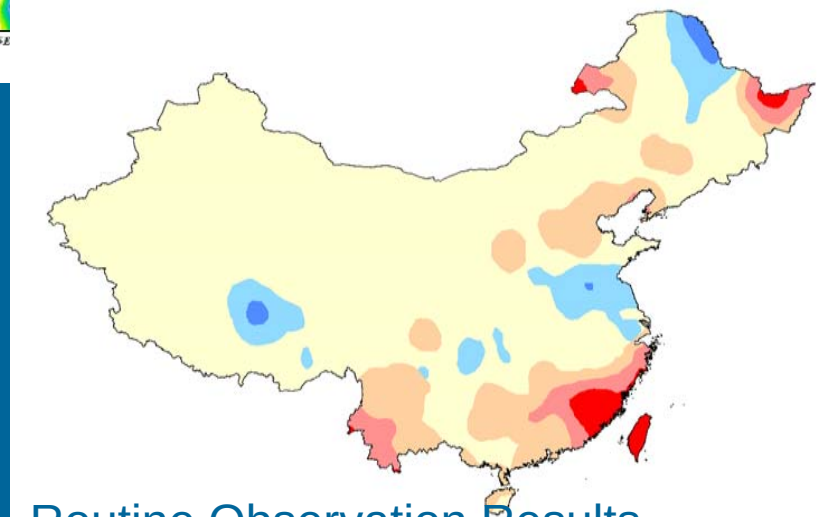




A:Severe Drought, B: ModerateDrought

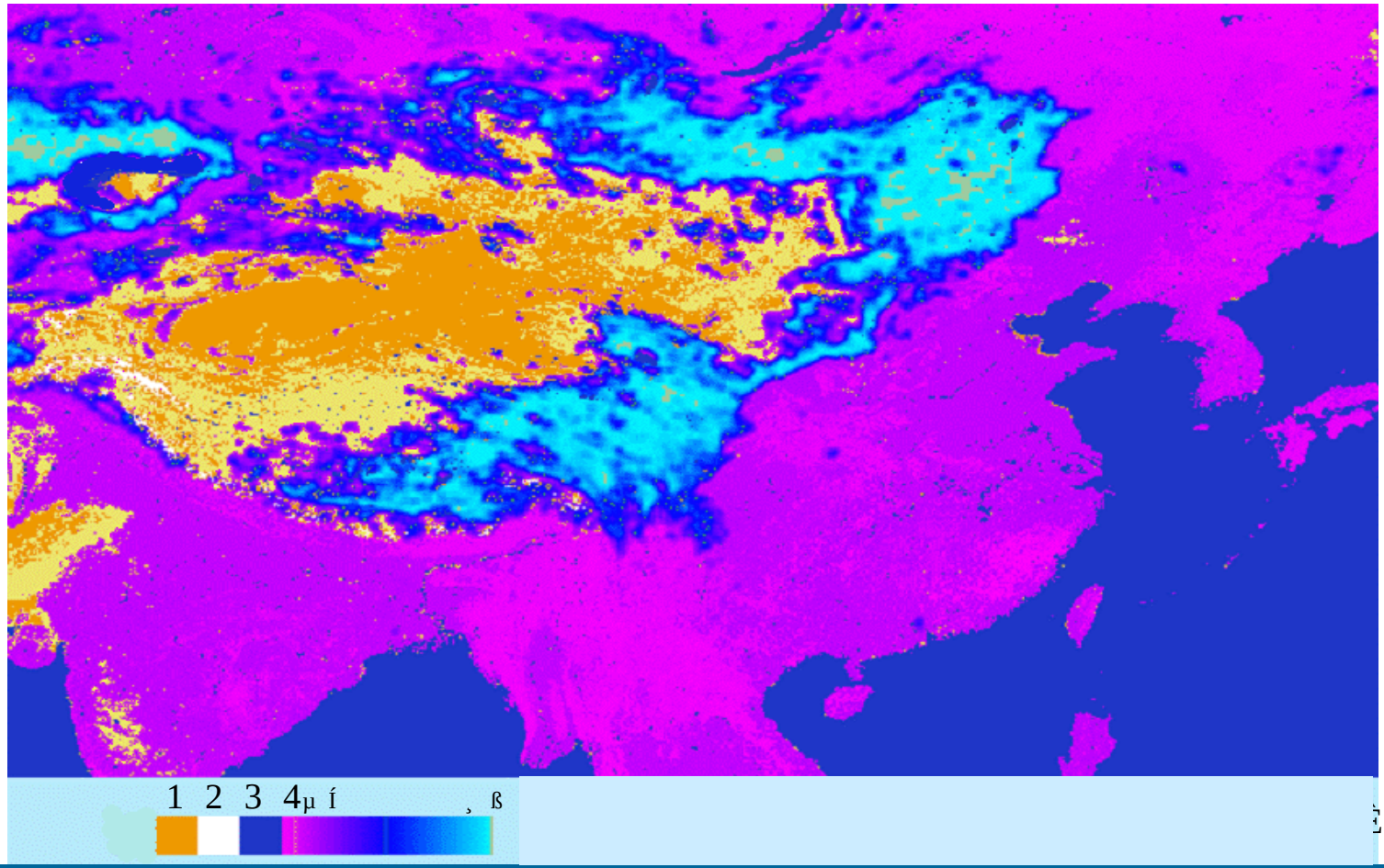
C: Light Drought, D: Normal

E: Water Body, F: Data Gap



Routine Observation Results

2. Surface Microwave Emissivity Retrieval

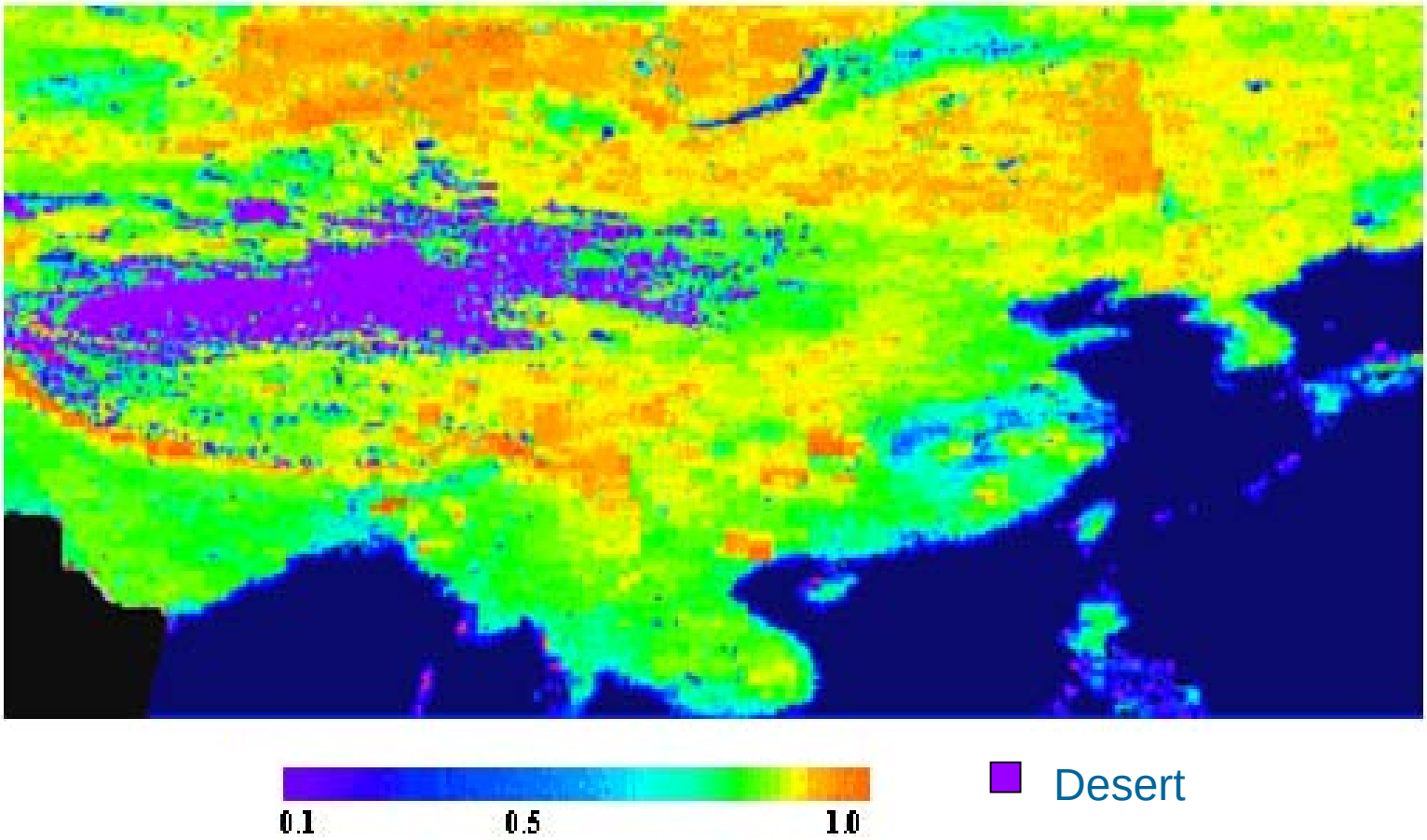


The percentage of bare soil in one AMSU-A pixel drieval from the data base of IGBP.

1: desert, 2: snow cover, 3: water body,

4: The percentage of bare soil in one AMSU-A pixel.

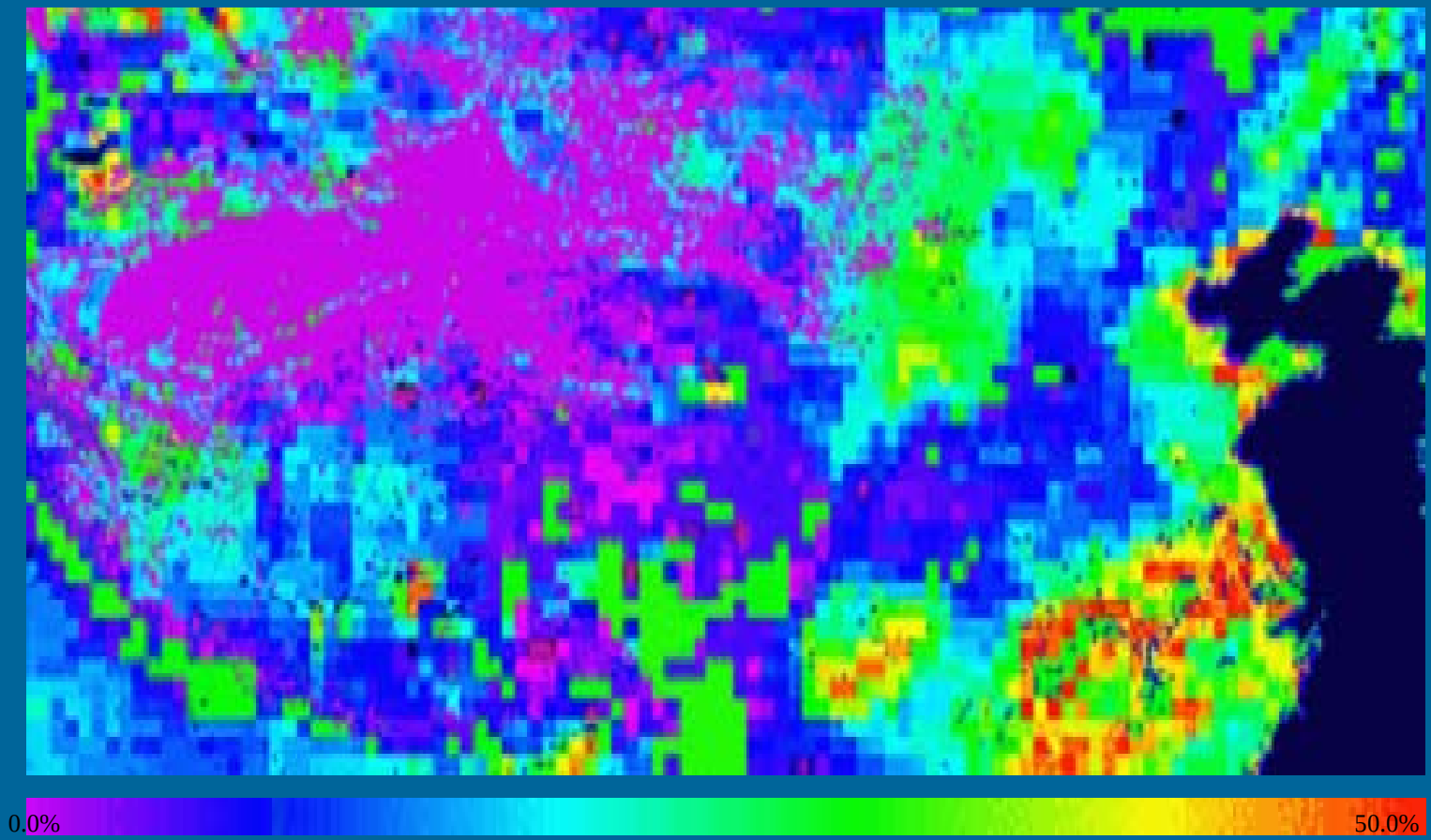
Surface Emissivity Retrieval Results by Using of AMSU-A D



AMSU-A ch3(50.3GHz) (2002.420~2002.4.30)

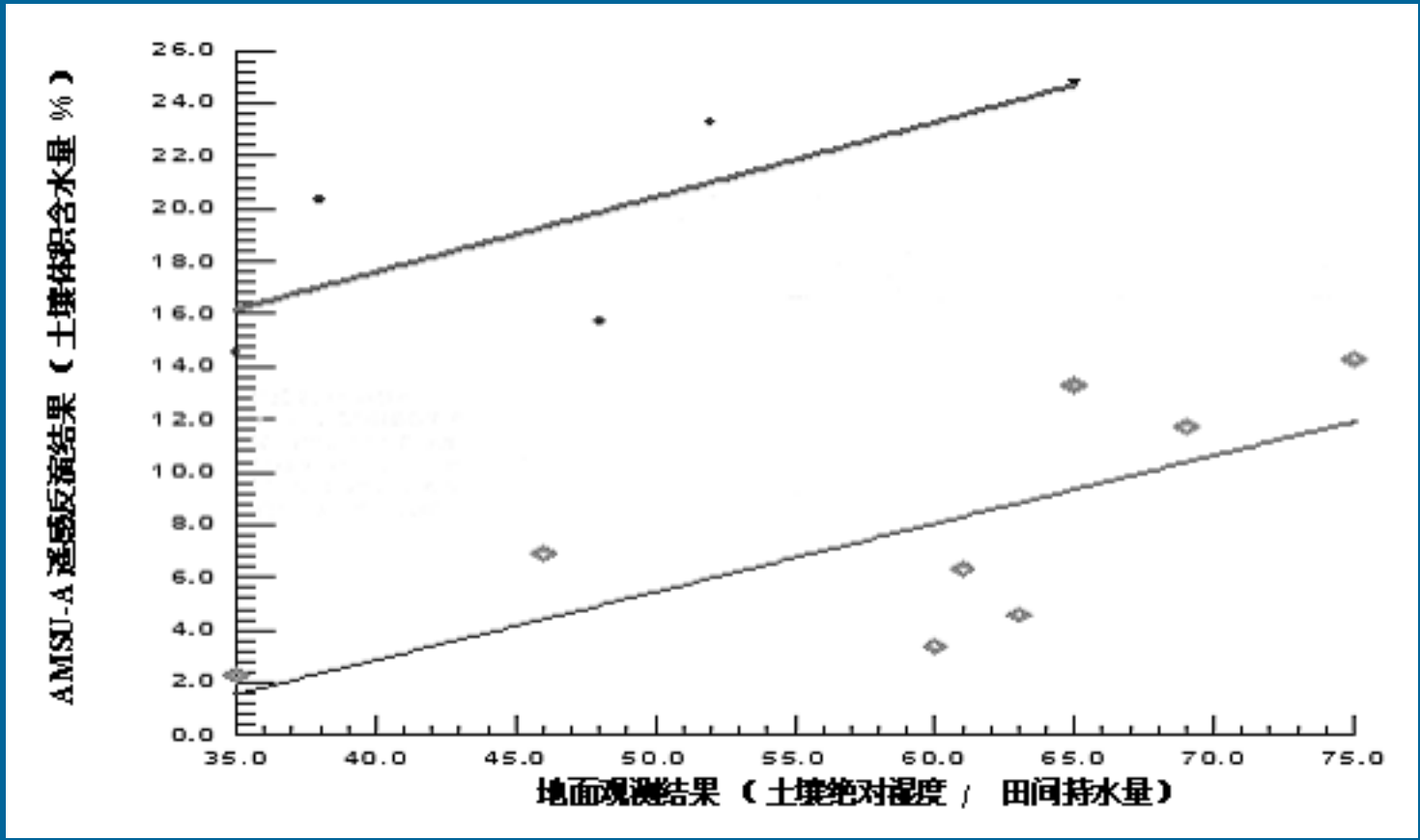
3. Surface Soil Moisture Retrieval

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.)

Conclusion

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.