Columnar Water Vapor Estimation Over Land Using Radiometer Data From SAC-D/Aquarius

Dr. Ing. Javier Epeloa

La Plata, Buenos Aires

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TRIACLE

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Main Objetives

- Estimation of columnar water vapor (CWV) over land using the MWR data.

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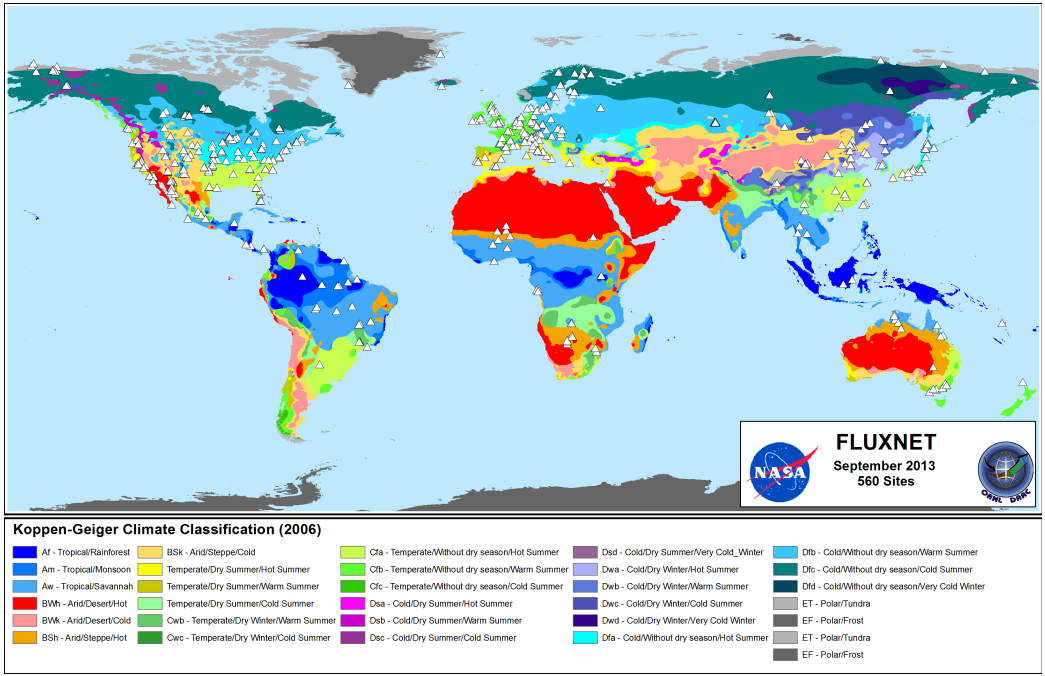
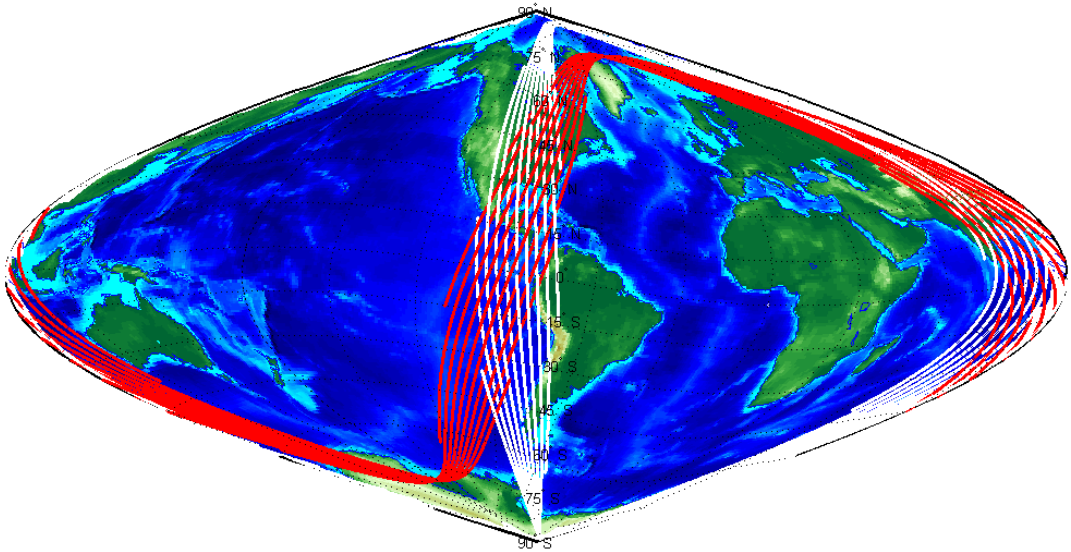
- Selection of the algorithm.
- Climate division of the land surface to perform the algorithm.

Köppen - Geiger climate classification



Data Selection



GPS stations

Radiosonde Stations

- The regional division is based on the vegetation.

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- The regional division permit to obtain coefficients of the algorithm by zones.
- The region of our analisis is at south-east of USA, where the climate type is Cfa (Köppen - Geiger classification).

Indice de la Presentación

Retrieval algorithm

$$CWV = A_0 + A_1 Ln(\frac{T_s - T_{b_{23.8}}}{T_s}) + A_2 Ln(\frac{T_s - T_{b_{36.5}}}{T_s})$$

Retrieval algorithm

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- Two frecuencies at: 23.8 Ghz y 36.5 Ghz (only vertical polarization).

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- Latitudes between: 30° N to 40° N, and Longitudes between: 100° E to 85° E from North America.

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- Brigthness temperature less than 300°K.

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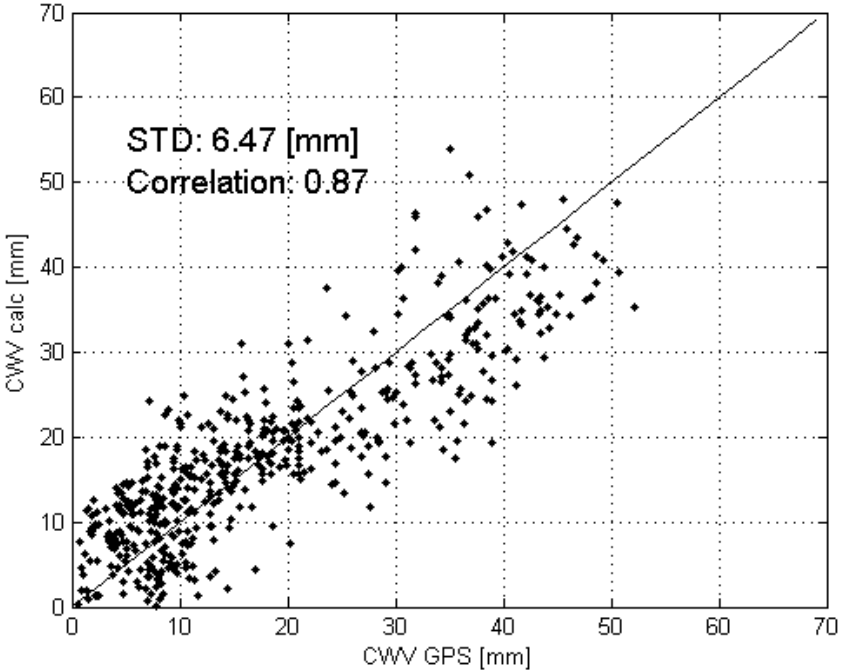
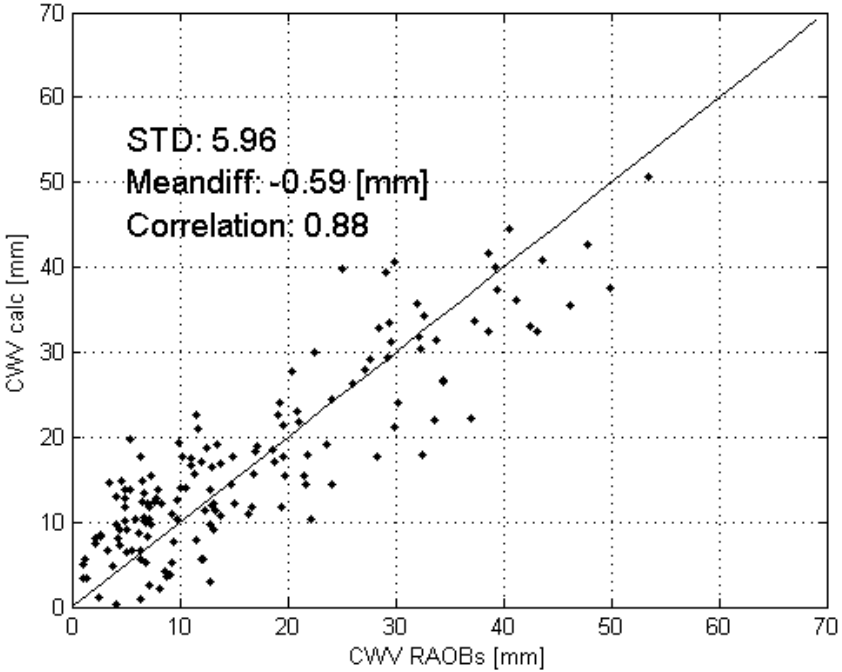
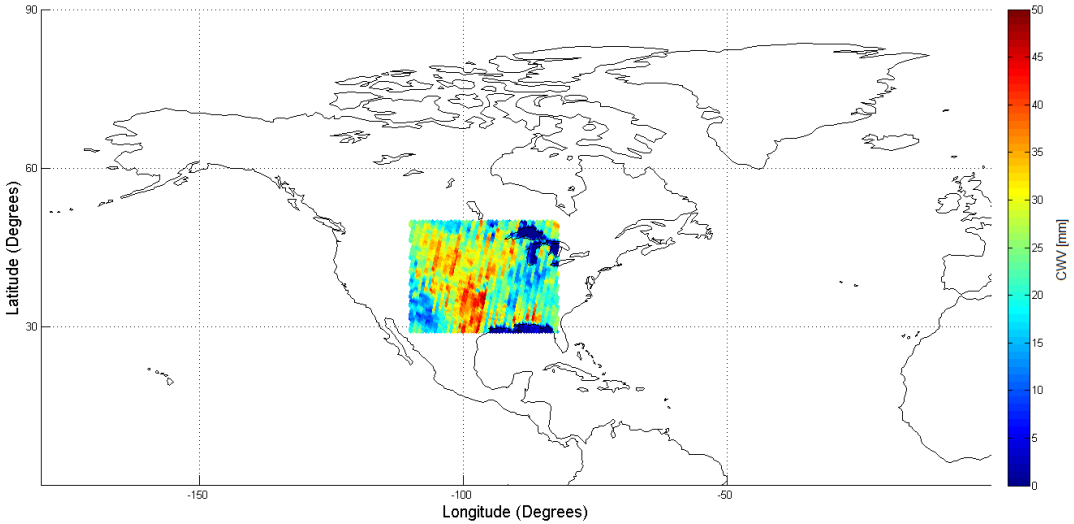
Results (GPS estimation)



Results (Comparison with RAOB observation)



Results (CWV map)



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- The standard deviation (STD) between CWV_{GPS} and CWV_{Cal} is 6.47 mm and the correlation is 0.88.

Conclusions

- We propose a log-linear algorithm in function of brightness temperatures at 23.8 GHz and at 36.5 GHz to obtain CWV in this region.
- The standard deviation (STD) between CWV_{GPS} and CWV_{Cal} is 6.47 mm and the correlation is 0.88.
- The CWV_{Cal} is compare with CWV_{RAOB}, the mean difference between both CWV values is -0.59.mm and its STD is 5.96mm

Future works

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- Inter-comparison with another instruments and techniques

Answers?

Thanks for your attention.