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Computing Local Tropospheric Models for Colombia Based on GNSS Data

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- Goal: Approximation to calculation of Zenith Tropospheric Delay (ZTD) based on GNSS

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- For surveys of less than a few tens of kilometers in extent, the tropospheric delay will tend to be the same at both ends of a baseline
- Neglecting to apply tropospheric refraction results in an absolute scale error (absolute troposphere biases) and wrong station heights (relative troposphere biases)

Theory

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- The tropospheric delay is written as the product of the delay in zenith direction and a mapping function

$$\Delta\varrho = f(z)\; \Delta\varrho^0$$

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- It is better to separate mapping functions for the dry and the wet part of the troposphere

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- Saastamoinen Model

$$\Delta\varrho = \frac{0{,}002277}{\cos z}\left[p + \left(\frac{1255}{T} + 0{,}05\right) e - \tan^2 z\right]$$

IGAC Approach

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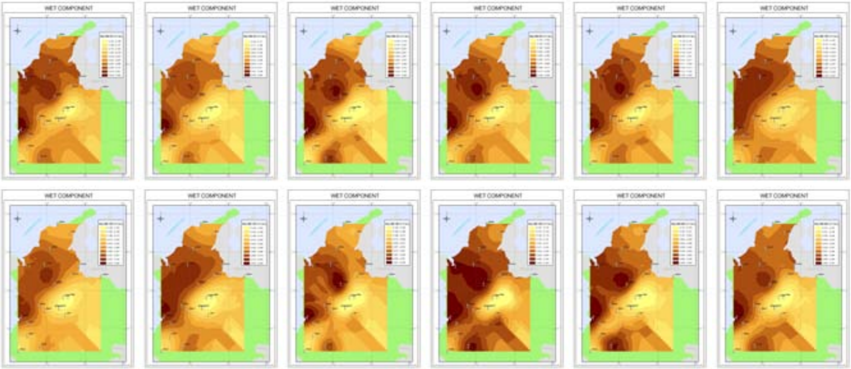
- Data were taken from GPS week 1520 (23.02.2009 - 01.03.2009)

Results: ZWD Correction, Day 058 - 2H



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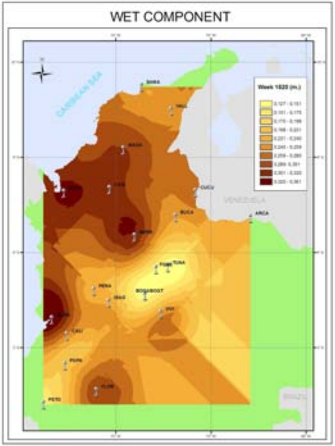
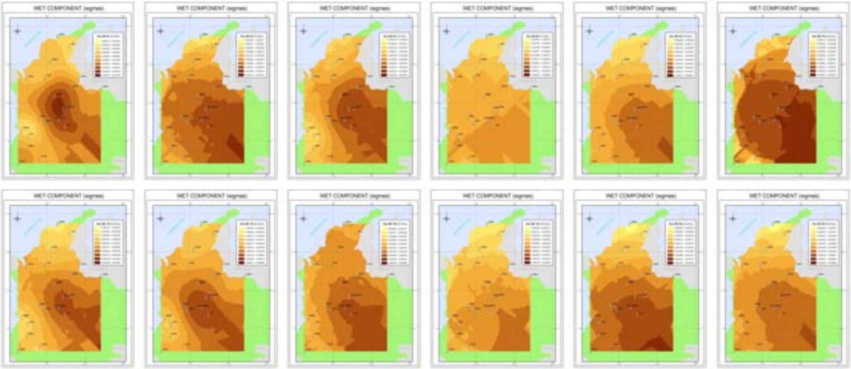
Results: ZWD Correction, Entire Week (1520)



Results: ZWD Residuals (std. dev.), Day 058 - 2H



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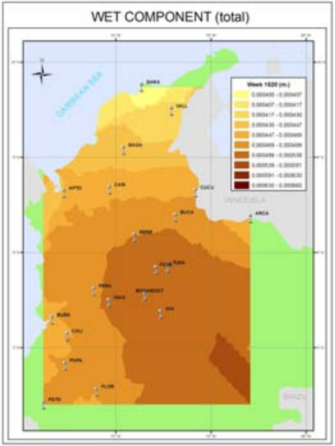
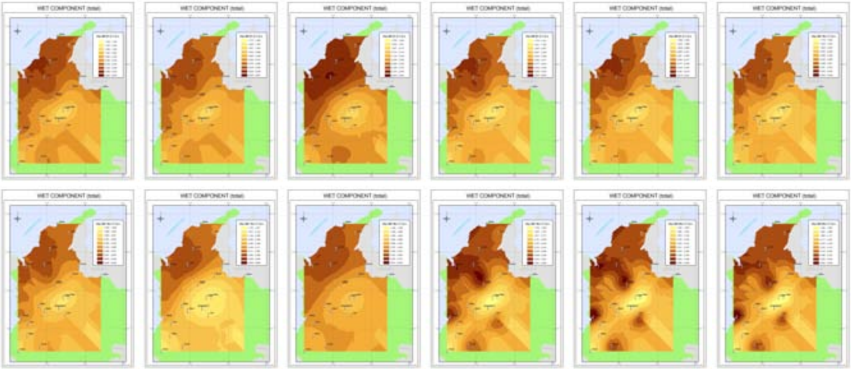


Results: ZTD, Day 058 - 2H



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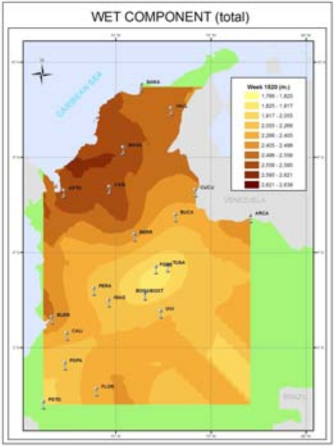

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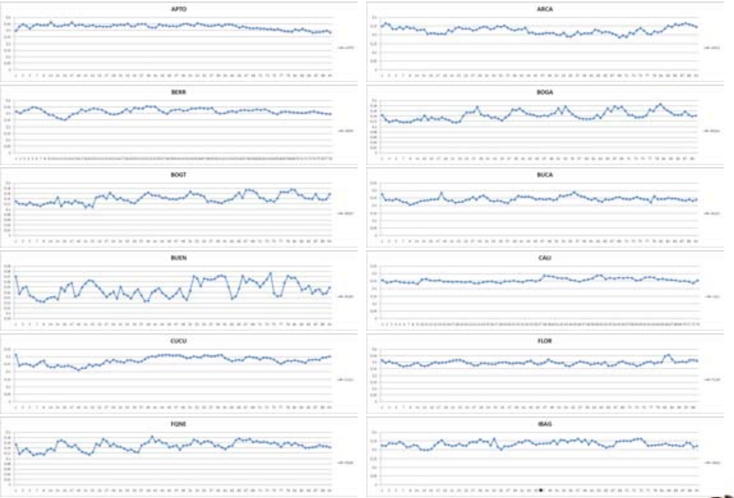
Results: Wet Component Time Series



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- Total monitoring (7/24) of local troposphere
- Improving densification of MAGNA-ECO
- Incorporate metereological Data

Thanks for your attention

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