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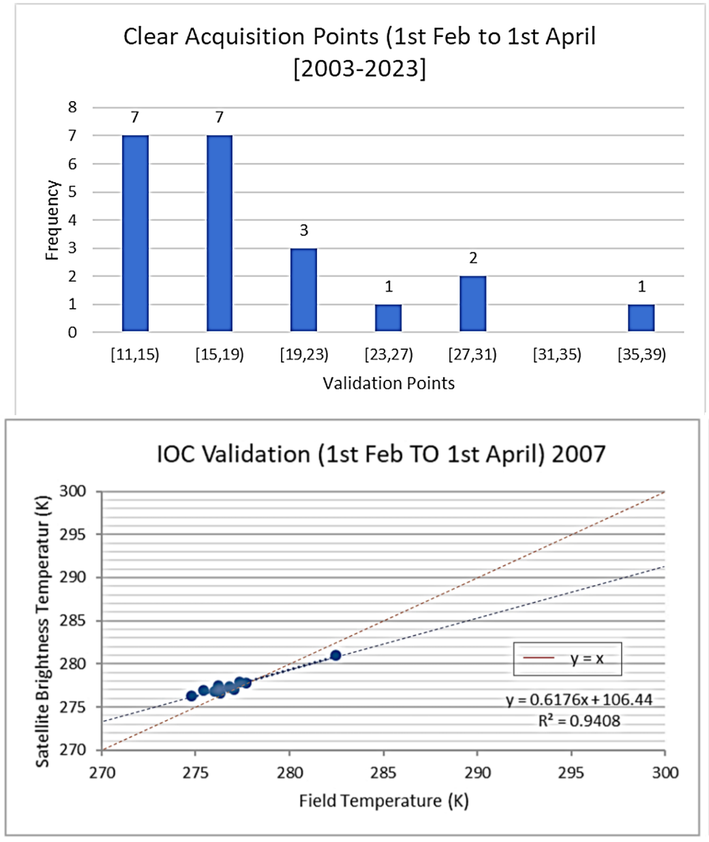
Ira RAI[1,2] and Simon HOOK[2]

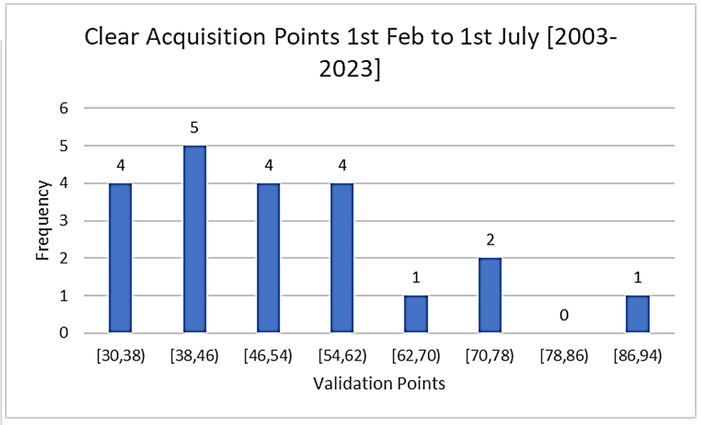
Jet Propulsion Laboratory (JPL), Pasadena, US

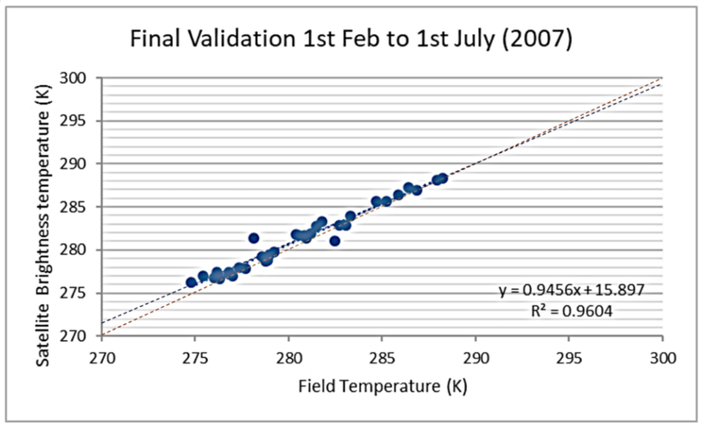
Dept. of Aerospace Engineering, Indian Institute of Technology Madras, India

Email id: ae21b024@smail.iitm.ac.in

Aqua MODIS Flight Validation Time







Aqua MODIS data

Aqua satellite orbits the earth with motives to study water cycle and atmospheric profiles with the help of MODIS instrument on- board satellite. It consists of 36 spectral bands.

The validation result for band 31 is shown.

Validation Results

The Aqua MODIS data over 20 years was processed to count the good validation points.

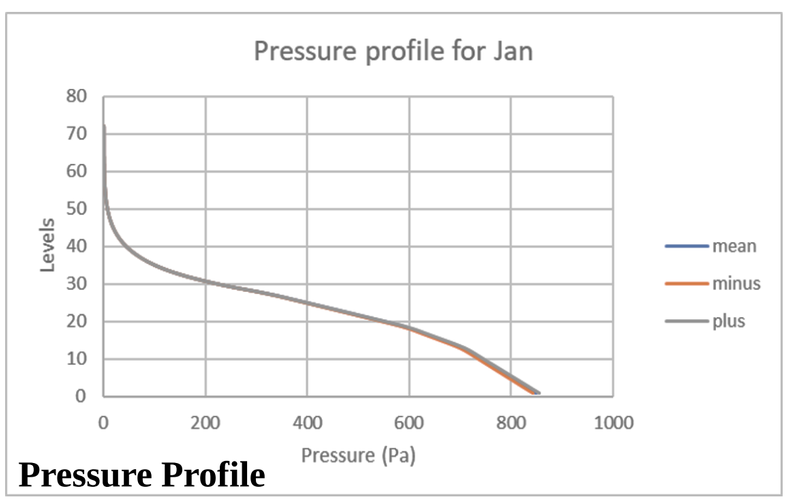
Results show us that in the IOC validation (1st Feb to 1st April), the error at 300K is 8.23K according to the regression plot shown at iii).

The error at 300K reduces to 0.423K in final Validation.

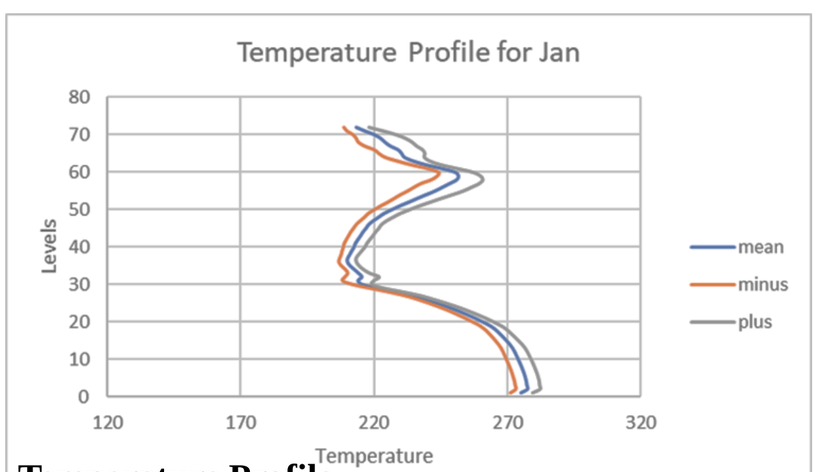
Thus we require minimum 5 months to validate the satellite data.

Average Atmospheric Profile Study for Lake Tahoe

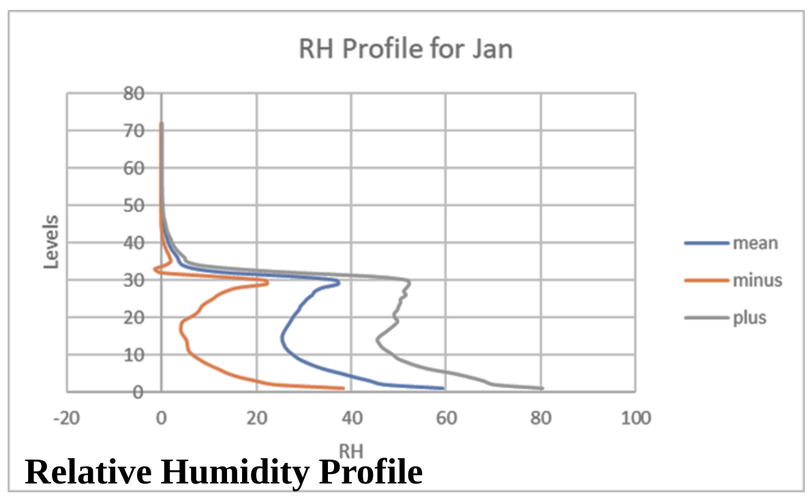
The Profiles were made over 20 years of data including only clear acquisition points. The profiles were plotted over 72 levels (surface to 80km). The average profiles were plotted along with mean + standard deviation and mean – standard deviation, showing the variation range of data. The profiles for January are shown.



Pressure Profile



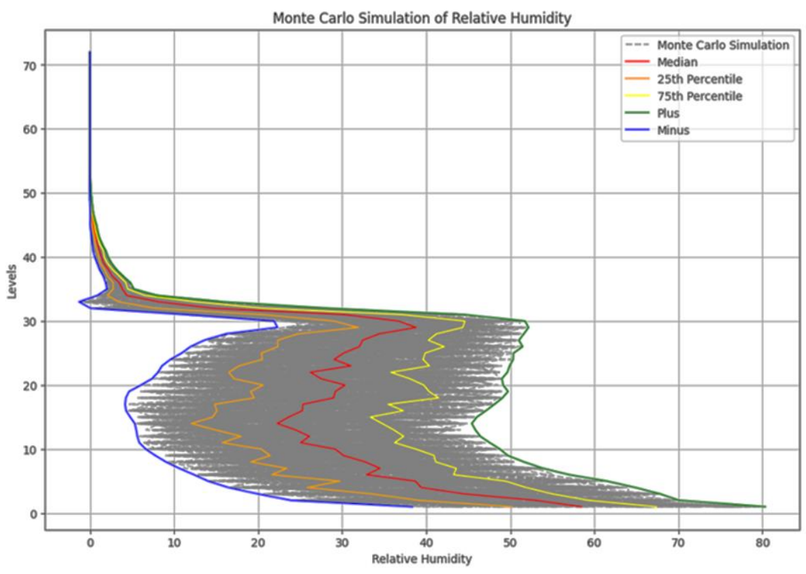
Temperature Profile



Relative Humidity Profile

Monte Carlo Simulations

Monte Carlo simulations involve repeated random sampling to obtain the likelihood of a range of results of occurring. It is used in processes that cannot be easily predicted due to intervention of random variables. Atmospheric models lie under complex systems and involve many underlying unknown variables. To estimate atmospheric profiles we use monte carlo simulation, below figures show monte carlo simulations perfomed by 2 methods.



METHOD -1

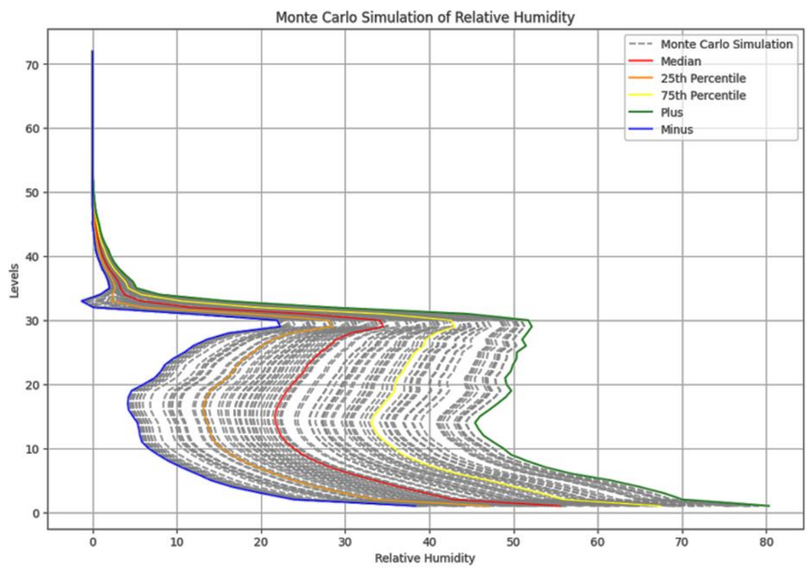
For each level there is a mean and standard deviation.

Level[i] -> mean[i] , std_dev[i]

Possible range for the variable:

(mean – std_Dev , mean +std_dev)

Randomly select a value between interval ‘n’ times.



METHOD -2

For each level there is a mean and standard deviation.

Scale the std_dev with a random number.

Iteration-1 : mean + std_Dev *k

Simulate ‘n’ times.