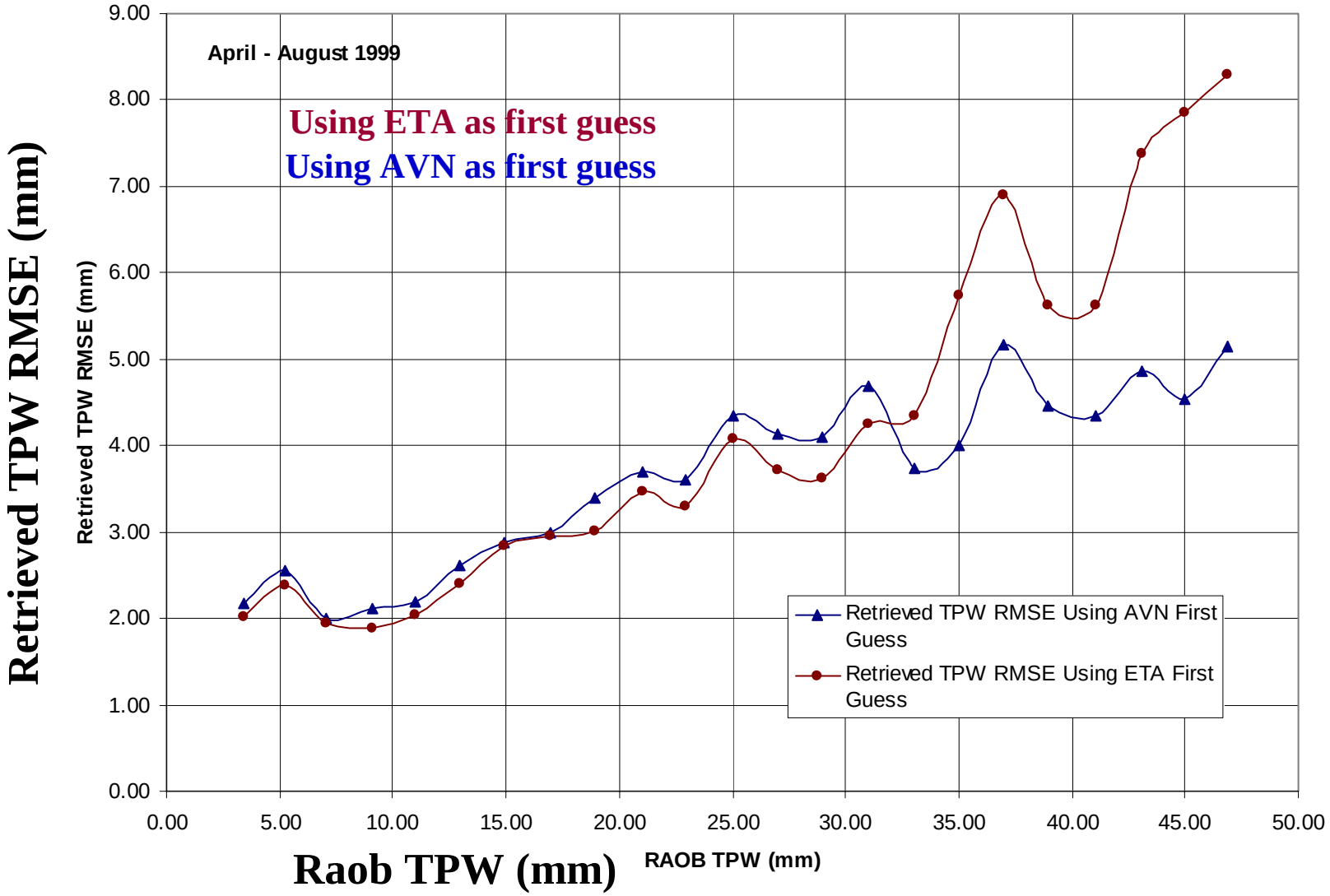
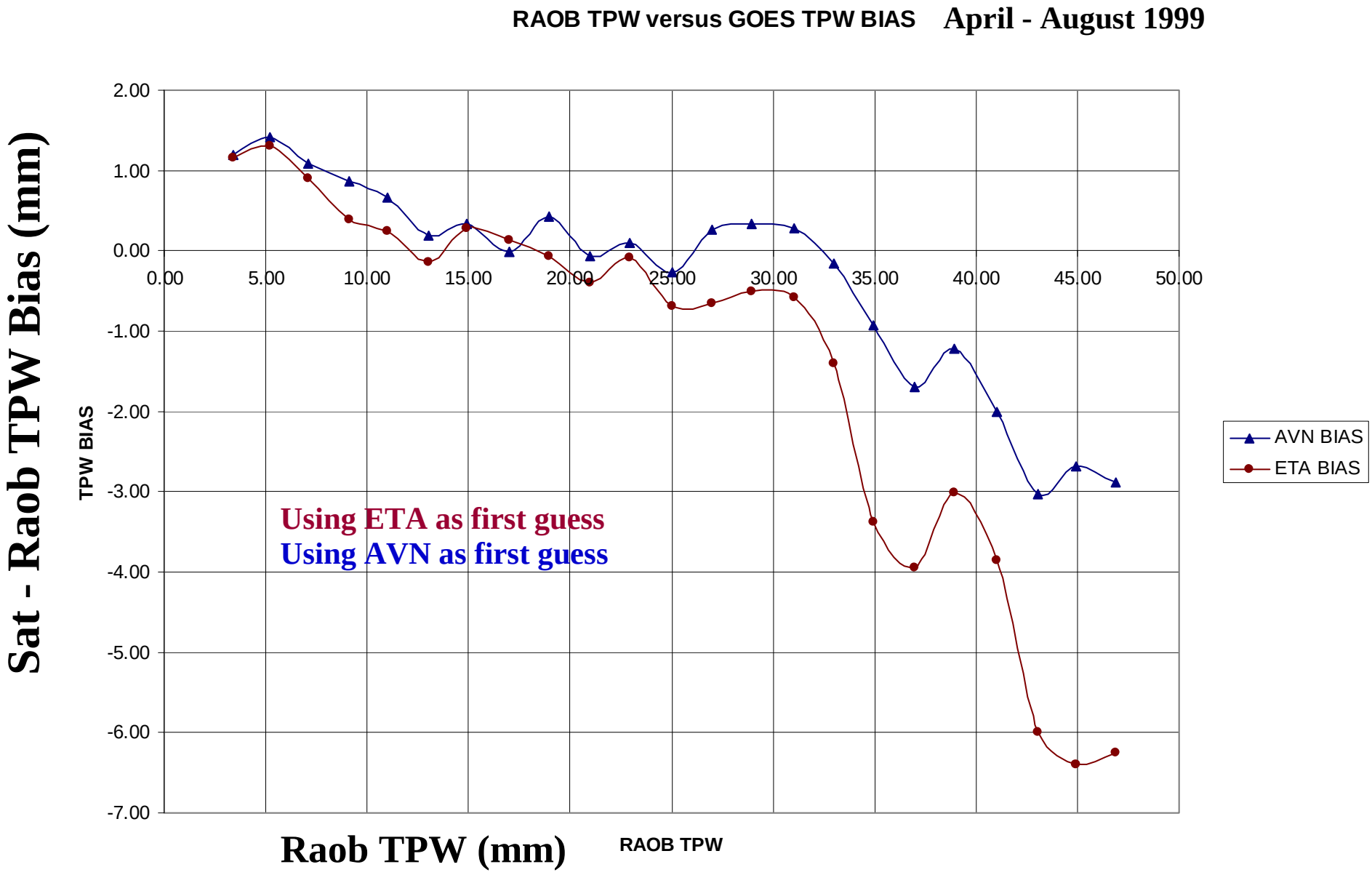
RAOB TPW versus GOES TPW RMSE **April - August 1999**



Comparisons from Gary Gray and Jaime Daniels



Comparisons from Gary Gray and Jaime Daniels

Overall AVN-based versus ETA-based GOES Soundings: The overall statistics from the GOES Soundings indicate that the AVN serves as a better first guess. There are periods of performance when the ETA is the superior first guess, but these are less frequent and less dramatic than the AVN. The following table shows the complete statistics from the parallel study performed by FPDT. The study was run for 80 days (beginning April 2nd, 1999) with a sample of nearly 75,000 match-ups.

	ETA Guess	ETA Retrieved	AVN Guess	AVN Retrieved
TPW RMSE	3.75mm	3.75mm	3.92mm	3.40mm
PW1 RMSE	1.70mm	1.80mm	1.77mm	1.68mm
PW2 RMSE	2.16mm	2.15mm	2.25mm	2.05mm
PW3 RMSE	1.34mm	1.30mm	1.45mm	1.37mm
TPW Bias	-0.34mm	-0.70mm	-0.11mm	-0.13mm
PW1 Bias	-0.65mm	-0.82mm	-0.67mm	-0.76mm
PW2 Bias	-0.04mm	-0.34mm	+0.27mm	+0.07mm
PW3 Bias	+0.32mm	+0.44mm	+0.26mm	+0.53mm
T950 RMSE	2.20C	X	1.84C	X
T850 RMSE	1.52C	X	1.54C	X
T700 RMSE	1.38C	X	1.20C	X
T500 RMSE	0.91C	X	0.93C	X
T950 Bias	-0.39C	X	-0.52C	X
T850 Bias	-0.14C	X	+0.19C	X
T700 Bias	-0.52C	X	+0.25C	X
T500 Bias	+0.08C	X	+0.07C	X

Summary:

The AVN clearly provides the superior first guess for this application, especially in more moist synoptic regimes.

Using the ETA first guess, the GOES retrieval algorithm is unable to improve the moisture profile. However, using the AVN first guess, the algorithm does an excellent job improving the profile; it reduces the TPW RMSE error by more than 0.5mm.

This ETA versus AVN discrepancy would be understandable if the ETA first guess was simply too good to improve. However, even though the AVN first guess is, indeed, worse than the ETA first guess, the retrieval made using the AVN ends up considerably superior to retrievals using the ETA.