TOPEX AND JASON MICROWAVE RADIOMETER ASSESSMENT AGAINST THE DMSP SSM/I AND TRMM TMI

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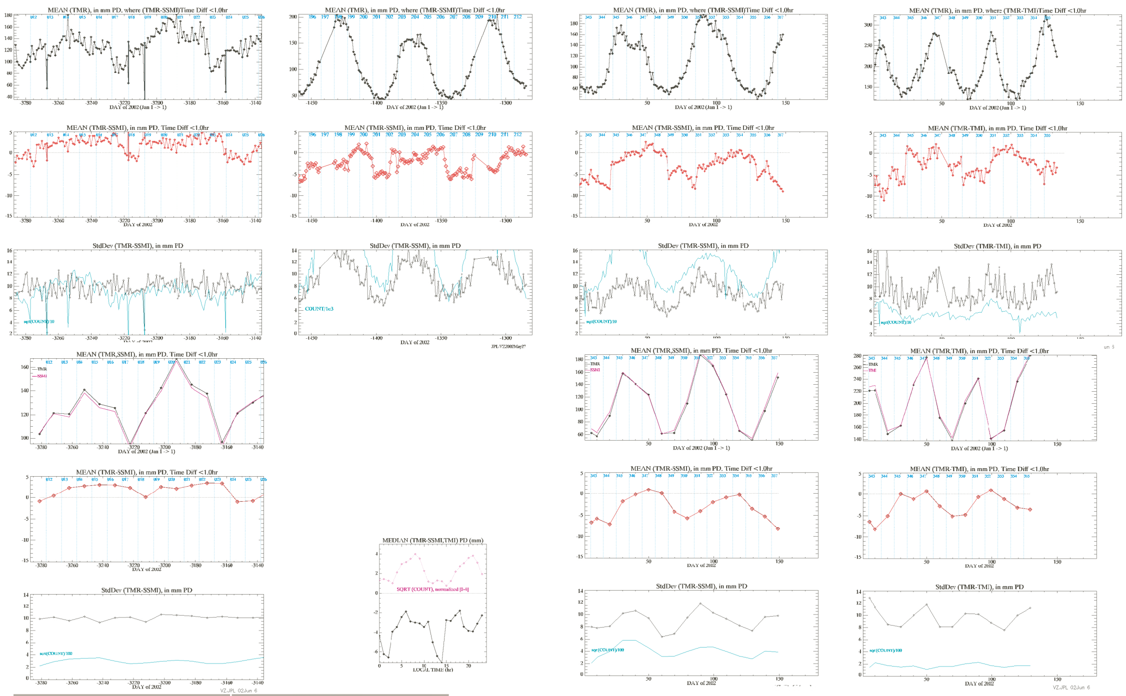
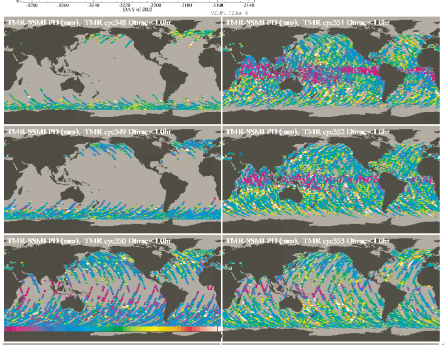
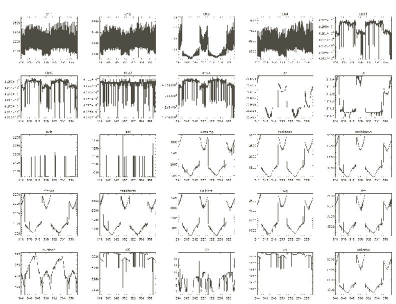
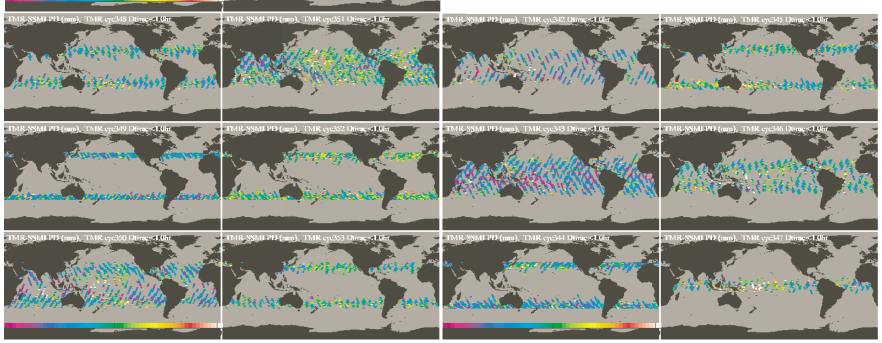
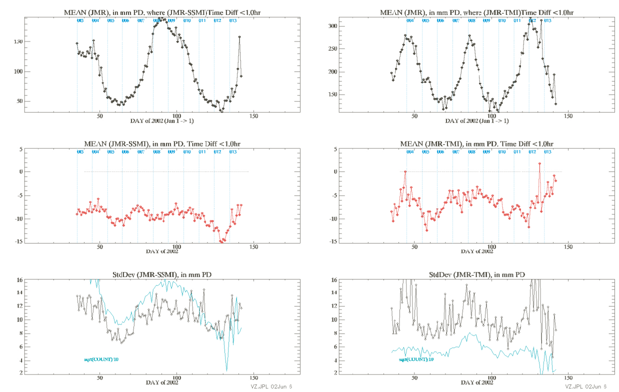


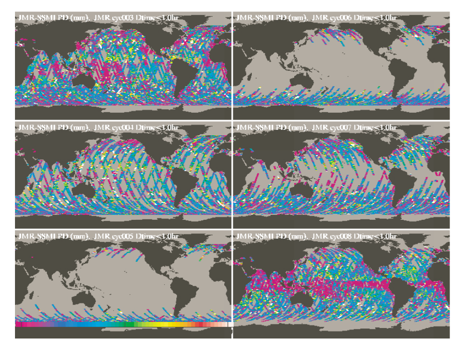






TMR and SSM/I water vapor data (in terms of path delay) were compared for 6 month periods in 1993, 1998, and 2002. Matches were accepted when the data values differed by <1 hr. The DMSP satellites are in Sun-synch orbits. TMR and TRMM's TMI were compared for 2002. TRMM is not in a sun-synch orbit, and its maximum latitude is 40°. Both SSMI and TMI were processed by F. Wentz. The daily-averaged differences clearly show 5mm 'jumps', whose timing coincides with a particular satellite manoeuver: change from Fixed to Sinusoidal YAW STEERING, or viceversa. Because these happen *usually* every 60 days (the periodicity of the orbit plane to the Sun direction), then this is also the periodicity of the jumps, which have been present since launch. TMR data more closely match SSMI or TMI data. During 'Sinusoidal' yaw steering, TMR measures more vapor. In 1993, the better match to SSM/I is during 'fixed yaw steering' times. However, the difference plots also show 3 points in time of the well-known TMR drift, and by 2002 the better fit is during 'sinusoidal steering' because all TMR data measure less vapor than just after launch.
While all internal temperatures also jump at these manouever times, the algorithm to retrieve path delay is supposed to correct for such changes in temperature. This effect also causes PD changes at specific local times.





For **Jason**, we performed a similar analysis. It shows JMR measures ~ 9 mm shorter (less vapor), on a global average, than either SSM/I or TMI. Clearly the global average masks a distinct spatial pattern. Although there are hints of similar jumps at satellite manoeuvers, their effect on the actual path delay is < 2 mm. Since JMR at this point awaits calibration, these results only point out the need for further in-flight calibraiton.