



Identify regional surface mass change in Greenland from GRACE satellite data.

Zheng Xu, Ernst Schrama, and Wouter van der Wal

Department of Astrodynamics and Space Missions, Faculty of Aerospace Engineering, Delft University of Technology, the Netherlands

With the help of more than 10 years observations of the global gravitational field from the GRACE mission, knowledge of the Greenland Ice Sheet (GrIS) melting is gradually improving. Results from different studies indicate a similar melting rate of GrIS averaged over entire Greenland, and considering the complete system the rate is around -250 ± 30 Gt/yr from 2003 to 2010. Whereas, obtaining regional melt rates from GRACE is difficult because of the relatively low spatial resolution. Also, measurement noise requires the GRACE data to be smoothed, which consequently spreads the mass variation signal out of the interest area, also known as “leakage”. Hence, this study introduces a mascon method and least square approximation which counteracts the leakage and estimates mass variation in separate regions in Greenland. Different selections of mascons have been investigated and compared with an SMB-D model