The mass variation in Antarctica from January 2003 to August 2008 is estimated from monthly earth’s gravity field models of GRACE RL04 products. To see more clearly the differences of J2, wavelet transformation is applied to the J2 time series derived from GRACE measurements by different agencies such as CNES/GRGS, GFZ, UTCSR and that from SLR observations. Periodic signals can be seen from the wavelet spectra. The Gaussian and Wiener filtering are compared, the result by using Wiener filtering is very close to that from Gaussian smoothing with a radius of 540km from 65 monthly models. The rates of ice sheet mass change is derived by fitting a straight line within each 1°×1° blocks with post-glacial rebound (PGR) effects being estimated from ICE-5G model. Meanwhile the NASA’s Ice, Cloud, and land Elevation Satellite (ICESat) has provided repeated laser altimeter data, and the ice sheet height changes are estimated by using crossover analysis by using the Level-2 product GLA12 of release 28 from March 2003 to March 2008 with 40-per-second resolution. The mass rates estimated from GRACE are compared to the ice sheet height changes from ICESat. For example, the mass rate in Amundsen Sea Embayment (ASE) is estimated up to -8cm/yr from GRACE, while the ice sheet height changes observed from ICESat is up to -32cm over more than 3 years, this shows the comparable results in this region. Keywords: GRACE; ICESat; Ice sheet; Antarctica; wavelets