Evaluasi model geoid global di Pulau Jawa

Abstrak

Resentday, the application and user of the GPS/GNSS technology become wider and vary in Indonesia. However the application is not optimal, as the GPS/GNSS height (geometric height) could not utilized especially for practical purposes. To optimalize, the GPS/GNSS height has to be transformed to the the orthometric height through the availability of geoid model. An alternative utilized geoid model is global geoid model (GGM). Seven (7) GGM have been evaluated in this research to determine the most suitable GGM for the case of Jawa island. First of all the differences among the model have been calculated and analized. Further, each GGM has been compared with the geometric geoid model derived from combination of geometric height (GPS/GGNS height) and orthometric height (Waterpass height). The comparison have been carried out absolutely within one point and relatively among the points. Based on mean differences between the GGM and geometric geoid the most suitable was determined. Finally the best GGM was fitted to the geometrics geoid using 2nd degree polynomial to determine its bias and get the hybrid global geoid model. The results show that the best GGM in Jawa island is GGM02C for absolute comparison and EGM08 for relative comparison with the relative acuracy of about 0.017 ppm - 52.63 ppm. GGM with higher orde and degree results in more detail and closer to the geometric geoid. Finally, the fitting results shows that the differences between the GGM to the gravimetric geoid significantly decrese and controlling the result using 5 independent points for absolut and 16 baselines for relative shows the RMS of 0.066m and 0.035m, respectively.