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Simulated experiment of recovering gravity field from the observations of satellite's frequency signal

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Recovering the gravity field with the satellite's frequency signal might be an alternative measuring mode in the future when the accuracy of the onboard clock was good enough. On the one hand, we analyze the performance of recovering gravity field model from the gravitational potentials with different accuracies on different satellite altitudes (from 200 km to 350 km) based on semi-analytical (SA) method. On the other hand, we analyze the performance based on the numerical analysis. First, the gravitational potentials along the satellite orbit are computed from the clock observations based on the method of satellite's frequency signal with the accuracies of 10^{-16} and 10^{-18}s. Then, based on the derived gravitational potentials, we recovered the gravity field models up to degree and order 200 (corresponding to 100 km spatial resolution). At last, the errors of recovered models are validated by comparing with the reference model.