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Impact of spacecraft attitude variations on the GRACE scientific results

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The aim of our work is to understand and reduce disturbance effects in gravity field determination from GRACE and to support the mitigation of noise sources for next generation missions. Systematic patterns in long time series of attitude variations of the GRACE spacecraft are discussed. The relative and absolute attitude variations of both spacecrafts are investigated as well as the attitude variations during different AOCS operational modes. On one hand, they are put into connection to orbital configuration, attitude determination sensors such as star cameras or inertial measurement unit, other sensors and satellite environment. On the other hand, they are put into connection to the K-band range geometric correction which should be applied before the gravity field solution is computed.