



Electrostatic accelerometers for future Earth gravity missions

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The return of experience of the GRACE and GOCE missions is beneficial to improve the present design of the ultra sensitive electrostatic accelerometer in terms of thermal stability, reliability and operational easiness for implementation in a short term GRACE type mission or in mid-term next generation gravity mission.

However, the next generation of low-low satellite to satellite tracking missions will take advantage of interferometer laser ranging methods to improve their performances. The configuration of the flying formation should also be much more complicated than the simple tandem of satellites orbiting on the same circular polar orbit. Consequently, beyond the measurement of the surface forces exerted on the spacecraft by the drag or the solar radiations, the accelerometer instrument takes a major part of the attitude and orbit control system by acting as drag free sensor and by accurately measuring the angular acceleration. So, the accelerometer will actively participate, in conjunction with the star trackers, to the fine attitude control of both satellites of the formation.

After a short description of the foreseen improvement with respect to the presently in-orbit models, the presentation will compare and discuss the advantages and the drawbacks of the possible ways of accommodation of the accelerometer, or combination of accelerometers, in the satellite with respect to the mission objectives.