

# Correlated Atom Accelerometers for Mapping the Earth Gravity Field from Space

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The knowledge of the gravity field, which reflect the mass distribution within the Earth system, enables to investigate the structure and dynamics of our planet and its external fluid layers: atmosphere, oceans, polar caps, hydrosphere. Observations on the gravity field thus contribute to the understanding our planet life and its climatic evolutions. In this context, the emergence of quantum technologies, including atom accelerometers, offers an opportunity to improve the performances of space geodesy missions (GRACE, GOCE).

The French space agency (CNES) has performed an assessment study (phase 0) called GRICE in order to determine the potential contribution of cold atom technologies to space geodesy and to the end users of the geodetic data. This preliminary project includes different level of activities: Mission and satellite definition, data treatment and instrument technical studies (laser development and qualification). Several mission scenarios have been studied. One of them, based on a twin satellite concept, seems highly relevant for gravity field mapping.