Title: The SEEGOCE Project

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(*Je fais partie de l'équipe SEEGOCE et j'ai indiqué en italique colorié la contribution spécifique IGN dans la présentation).*

The Solid Earth Exploration with GOCE (SEEGOCE) project selected by ESA is aimed at improving the knowledge of the inner solid Earth using the GOCE data. Indeed, investigating the mass distribution and, whenever possible, the mass transport inside the Earth system, is a mandatory task in order to assess the solid Earth's composition and geodynamic processes. This is the reason why the GOCE mission, aimed at accurately mapping the global Earth gravity field, attracted such large interest in the solid Earth community. The use of the GOCE data, combined or not with other geophysical-geochemical-geological information, should allow the solid Earth scientists to map the Earth's interior, from global to regional scales, and thus to better characterize the dynamic processes acting inside the Earth and the interaction of the solid Earth with the external fluid envelops. The resolution of the GOCE data will be sufficient to study geodynamic issues at the scale of the mountain ranges or subduction zones. Consequently, the solid Earth community expects a better understanding of major scientific questions. In addition, whereas GOCE mission was not designed to map the time-varying gravity field, we also intend to investigate the potentiality to extract information on high resolution space and time variations of the gravity field in some areas of interest such as the ones where large devastating earthquakes occur.

In order to meet these expectations, we have been carrying out some data acquisition and specific developments in data analysis. More specifically, we focussed in the recent years before the arrival of the GOCE data on:

- *How to validate the GOCE gravity products versus ground observation of gravity anomalies.*

- How to image the inner Earth at various scales

In these fields, we acquired new surface gravity data combining absolute and relative measurements over the whole French territory and we developed new approaches for combining ground gravity and GOCE type data. Finally, we also developed specific methods

for exploiting the gradient information and for the combined analysis of GOCE type data with other geophysical information.

We present and discuss these various topics and our first results with real GOCE data, which will be available at the time of the symposium.