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Measurement System for Gravity and Vertical Gravity Gradient Component using AUV/ROV for Seafloor Resource Exploration

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Mineral reserves is a very important fundamental parameter for natural resource exploration, and the gravity anomaly measurement is one of the useful physical exploration tools to find natural resources and to estimate its reserves. Today the mining of seafloor hydrothermal deposit is a very urgent national issue. However the measurement of gravity anomaly caused by the seafloor resources has not been well established in the instrumentation. The deposit model calculation shows:

- (1) the resolving power of 0.1 mgal of gravity and 10E of vertical gravity gradient component is needed for the exploration of the seafloor hydrothermal deposit
- (2) gravity gradient is a physical parameter that is very sensitive to the deposit depth below seafloor.

Therefore, we have started developing the high sensitive measurement system for gravity and vertical gravity gradient component, which is to be installed to a moving platform such as AUV/ROV. Such hybrid system or integrating system of gravimeter and gradiometer should be effective to find a near seafloor deposit and to estimate mineral reserves. We plan to accomplish the development in two years

Keywords: gravimeter, gradiometer, physical exploration, moving platform, seafloor hydrothermal deposit