

# Around the World with Professor Vening Meinesz – On the First Gravity Measurements in the Oceans

**Bart Root (Netherlands)**

**Key words:** Education; History; Gravity field

## **SUMMARY**

In November 1934, Den Helder, The Netherlands, the start of a remarkable voyage commenced. The Hr. Ms. KXVIII, a Dutch submarine, was about to set sail to Soerabaya, Indonesia. Onboard was a Dutch professor, Felix Andries Vening Meinesz. The life's work of prof. Vening Meinesz are his numerous submarine expeditions. He was able to measure the Earth's gravity field with similar precision as on land for the first time in history. Along these expeditions, the professor took his innovative pendulum apparatus, folklorised by the sailors: Het Gouden Kalf (the Golden Calf). Up until 1950, the Golden Calf was the only instrument measuring the gravity field with such precision and was responsible for 37 years of ocean gravimetry. His ground breaking data and systematic way of working changed the way of performing scientific expeditions.

With the Library of the TUDelft and "Stichting Academisch Erfgoed" (Academic Heritage Foundation), we revisit a particular expedition and use it as a stepping stone to web-based geodetic and geophysical education for students and the public. The KXVIII sailed over spreading ridges, transform faults, hotspot volcanos, subduction zones and many more interesting geological structures, which are discussed in this application. The importance of geodetic research is heavily present along the complete voyage in the form of global geoid determination. Moreover, the precision of the observations onboard the KXVIII are compared with current satellite gravimetry and prove to be remarkable accurate. The goal of the project is to make the several datasets of Vening Meinesz, his measurements, articles, media, old photos and other objects of the KXVIII voyage, accessible for the public. The results of that project can be found on an interactive website: [expeditiewikipedia.nl/#vening-meinesz](http://expeditiewikipedia.nl/#vening-meinesz)

The user can follow the famous voyage from Den Helder to Surabaya in this interactive web application, stopping at interesting geophysical or historical places in space and time. The user can

---

Around the World with Professor Vening Meinesz – On the First Gravity Measurements in the Oceans (10809)  
Bart Root (Netherlands)

FIG Working Week 2020  
Smart surveyors for land and water management  
Amsterdam, the Netherlands, 10–14 May 2020

learn about plate tectonics and its historical findings, study the equipment that Vening Meinesz used to observe the gravity field with extreme precision, and learn about the important collaboration between science and the Navy. We would invite you to dive into the adventure of the geo-scientific research of professor Vening Meinesz.

---

Around the World with Professor Vening Meinesz – On the First Gravity Measurements in the Oceans (10809)  
Bart Root (Netherlands)

FIG Working Week 2020  
Smart surveyors for land and water management  
Amsterdam, the Netherlands, 10–14 May 2020