

Heading Error of Andrómeda's class hydrographic survey vessels

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Abstract:

Marine magnetometer data is normally obtained towing a magnetometer from a vessel. Vessels are normally 90% built up with ferromagnetic material. These materials produce an influence on the magnetic field measurement, which will change with the distance and direction to the magnetic north (Bullard and Mason, 1961).

In Portugal Hydrographic Institute the near shore magnetic surveys frequently takes place in two hydrographic vessels, NRP Andrómeda and NRP Auriga. For magnetic data interpretation it is important to remove the magnetic influence from each of these vessels. This influence, called heading error, can be calculated by an algorithm shown by Bullard and Mason in 1961.

Two surveys were conducted, one in each vessel, with a towed precession proton magnetometer, with an Overhauser effect. Each survey had two different groups of planned lines, with a different heading, and each of one was conducted with several different distances between the magnetometer and the vessel.

The data was processed in Matlab software (The Math Works Inc.) and the results showed not only that some conditions must be taken into account in this measurement, but also that a group of planned lines were more efficient to obtain the magnetic influence of this each of this two vessels (Figure 1)(Silva, 2013).

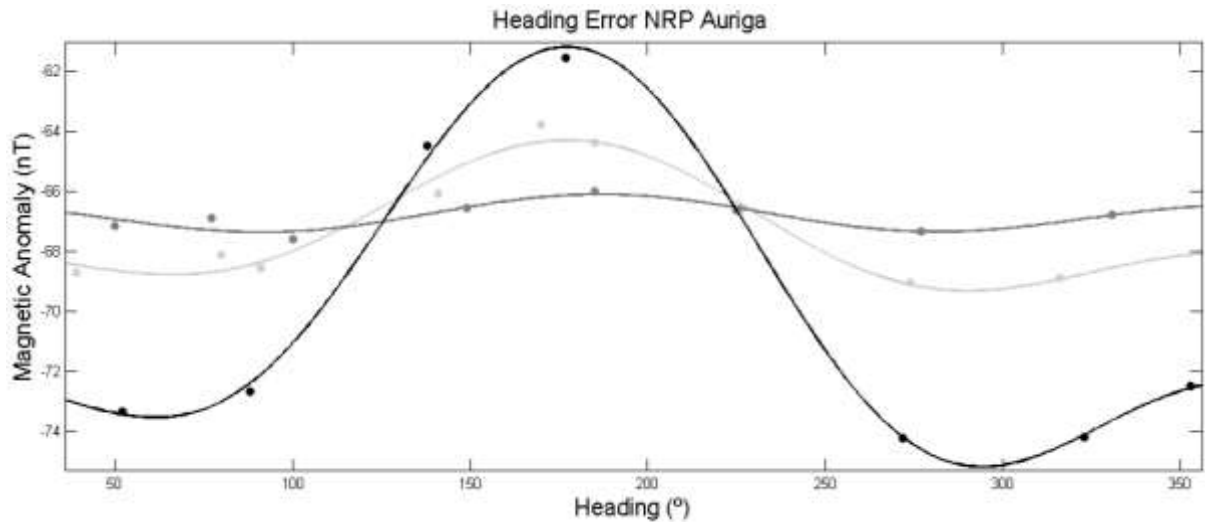


Figure 1: Projection of magnetometer data results, magnetic anomaly (X axis) versus heading (Y axis), obtain from a towed magnetometer at a distance of 80 (black line), 120 (light gray line) and 200 meters (dark gray line) from the ship. With the same colors are the fitting curves projections.

Keywords: heading error, magnetic field, magnetometer.

References :

Bullard, E. C. e R. G. Mason, 1961: The magnetic field astern of a ship. Deep Sea Research, Vol. 8, p. 20 a 27.

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