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# Scalar compensation of shipboard three-component magnetic measurements and applications for marine geophysical mapping

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Since the 70's, ship-mounted three-component magnetometers are used for marine geophysical mapping, with the benefits of being able to be operated permanently with a minimum of technical maintenance. However, to obtain accuracies similar to those of ship-towed absolute scalar magnetometers, the intense interfering magnetic fields generated by the hull and steel parts of the ship have to be removed. The most common correction method, called "vector compensation", uses high precision inertial navigation systems in order to correct the measured data for the ship's magnetic field and calculate the vector of the compensated magnetic field in the Earth coordinated system.

This work alternatively uses the "scalar compensation" method applied in airborne magnetism since the 60's. The aim is to compute the intensity of the compensated magnetic field without measurements of the attitude of the vector and using linear least-square regression analysis. This correction method is applied to shipboard three-component magnetometer data acquired on different vessels during different surveys. Results are compared to those obtained with ship-towed absolute scalar magnetic measurements.

**Keywords**: shipboard three-component magnetic measurements; magnetic compensation; marine magnetics.