Geomagnetic sensor random error modeling and compensation

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Abstract: The characteristic of the output error of the geomagnetic sensor is analysed and the finite difference method is used to smooth the non-stationary data of geomagnetic sensor. Then the ARIMA model of the non-stationary data is established by using the time series analysis method. Considered the time series model as the State equation and the present moment measurement data as the measured values, this article designs the Kalman filter based on the model of ARIMA(3,2,0) to deal with the output data of the geomagnetic sensor. The result shows that the mean square error of the measurement data reduced 73.6% after filtering. The result of the raw data has proved the validity of the proposed model and filtering method. The research methods of this article can also be used for error modeling and filtering of. other kinds of sensors.. © 2010 IEEE.

Author Keywords: ARIMA model; Geomagnetic sensor; Kalman filtering; Time series analysis

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