THERMAL STABILITY OF THE MAGNETIC FIELD SENSOR

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Abstract

It is necessary to reduce errors due to environment factors as well as the inner factors of the system during the operation so as to ensure the accuracy and stability of the electric compass system. Environment factors are *temperature effects, variations of the Earth's field,* etc. This investigation brings methods out to help improve the performance of the compass system when it is affected by temperature. In this thesis, I proposed two different methods to compensate the temperature effect. *The first method* is feed-forward compensation. By calibration process, we can observe the dependence of the angle deviation to the temperature range. After that, this relation can be fitted by a linearized function. In practical, the output of the compass can be compensated by using the measured temperature and this linearized function. *The second method* is feedback compensation. It is a better solution for error reduction due to the temperature effect. A feedback system is added by the temperature stabilizing. By using PID algorithm, temperature of compass system is controlled and it will achieve a desired temperature. When compass system is always operates at the desired temperature point, the error values will not occur regardless of whether changing temperature of environment is happen or not.

Keywords: *Temperature effects, feed-forward compensation, feedback compensation, PID.*