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Induction Magnetometer transported by UAV for power lines monitoring

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Assessment of a power lines condition is an important task for all countries. It includes GPS mapping of the: 1) wire breaks; 2) places of the increased current leakage, for example corona detection; 3) degree of wires sagging between power line towers; 4) location and conditions of the power line towers; 5) vegetation encroachment along a power line corridor. Considering that power line currents, including leakage currents, create strong magnetic field, use of magnetometers in the range from DC to sound frequencies for the solution of tasks 1-4 is highly prospective. At the same time, it is possible the control of the vegetation critical proximity to a power line adjacent zone by the increased leakage current (threats of the increased leakage current or breakdown to a tree crown). Thus the task 5 also can be solved.

The goal of the present report is to introduce the new design of miniature low-weight three-component sensor for measurement of alternative vector magnetic field onboard UAV – induction magnetometer (IM) - with autonomous system including two-component tiltmeter and GPS antenna inside in order to obtain precise measurement timing, UAV coordinates and altitude during movement. These data are stored in the SD memory card. Construction details, tests results and technical specifications of this IM for are presented.