



Induction magnetometer for the RESONANCE project - parameters analysis

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The RESONANCE experiment focuses on the study of the processes in the inner magnetosphere of our planet. The objectives of the project include the investigation of interactions between waves and particles, and monitoring of the large-scale changes in the magnetosphere associated with geomagnetic activity and magnetic storms. The study of magnetic fields is of prime importance for RESONANCE project, taking into account that the special appeal of this mission is that four spacecrafts will be simultaneously launched at the specially designed path - the so-called "magnetosynchronous orbit" - when all the four spacecrafts will be some enough long time within the sole magnetic line. Thanks to its unique orbital configuration and instrumental composition, the RESONANCE project gives best opportunity for study of elongated structures in the magnetosphere of the Earth.

The AC magnetic field will be measured by the three-component induction coil magnetometer LEMI-606, developed for the study of magnetic field fluctuations in space conditions in the frequency band 1-20000 Hz.

It is known that the plasma parameters vary rapidly in space and time, so in the case of simultaneous measurements at four points special demand of high temporal resolution and low measurement error must be provided. To this, the identity of the parameters of all four devices that will be installed and operating simultaneously on all satellites becomes the major requirement. These all requirements were taken into account at the development of the LEMI-606 magnetometers.

Another feature of these magnetometers is strongly nonsymmetric construction which is due to the general satellite design. Such an arrangement of the magnetometers leads to the increase of their cross-talk and nonorthogonality. The influence of the magnetometer construction on its parameters is analyzed. A comparison of the magnetometers parameters of symmetric and nonsymmetric design is carried out and experimental results are presented.