

## Study on design of analog integrated circuits of a compact environment monitoring system

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Environments in space are strongly controlled by electromagnetic phenomena. Since space plasmas are collisionless, we can recognize a status of electromagnetic environments by monitoring plasma/radio waves. Plasma wave receivers onboard satellites have the capability to study electromagnetic environments in space. Therefore, they can be used monitoring space environments when we extend our humanosphere to space in the future. For example, they can monitor the interaction between the huge structure such as space colony and space plasmas that might cause artificial disturbances around the structure. However, we need to conduct the continuous monitoring of changes of electromagnetic environments in space. Since their weight and size are heavy and large, we need to re-design plasma wave receivers to meet their objectives that they monitor the space environments in the multiple points around human activities. Thus, we propose a compact, inexpensive, and low weight monitoring instrument.

To develop the compact monitoring system, we design a part of analog circuit of the monitoring system, using ASIC (Application Specific Integrated Circuit) technology. Using ASIC technology, we can make analog circuit small and low weight, and reduce its electricity consumption. Thus, ASIC technology will contribution to realize compact monitoring system.

Firstly, we need to examine whether ASIC technology can be used for this system. Generally, more noises occur in an integrated circuit, and IC tips we design never show the same performance from each other. We need to design circuits and examine these influences. Furthermore, there are many problems in designing ASIC, such as cross-talk, relations between circuits and size of tip.

We made several circuits in ASIC as test design. We will show some result of simulation, estimation of the test design, and future plan.