

The Replacement of Kakioka Automatic Standard Magnetometer

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Since 1973, Kakioka Automatic Standard Magnetometer —KASMMER— (Yanagihara et al. (1973)) has been supplying stable and highly reliable geomagnetic data (Kuwashima (1990)). Especially, the optical pumping magnetometers (OPM), yielding stable base lines, have been acting the main role in KASMMER. The performance of the OPMs was outstanding 20 years ago and may hold still now.

The stable observation by OPM has been continued for 20 years, that is, far more expected for the electronical instrument to be operated without any stop. The signals of them have become noisy and the occurrence of irregularity of temperature controllers has increased very much. It was supposed that they would soon come to end.

Before the complete breakdown of the instrument, the replacement of the OPMs with a new instrument was prepared. A committee of KASMMER replacement was held several times in our observatory and the planning of replacement project was discussed. There were basically two choices for the new instrument; one is getting new optical pumping magnetometers and the other a set of a fluxgate and proton precession magnetometers. The latter satisfies various needs for the data quality independently by each magnetometer. After careful examinations, the committee finally decided to adopt the latter for the new instrument.

The existing sensor houses and pillars are continued to be used. DI-72 and a proton precession magnetometer for the absolute measurement are not replaced because they are not degraded apparently from the initial status.

Together with the replacement of the variation instrument, the computer system was also replaced. The previous system which consists of two sets of stand-alone mini computers was changed to that composed of several work stations connected by local communication lines.

The budget for the replacement project was approved by Japan Meteorological Agency as a four years (1989-1992 fiscal year) program with the aid of the comprehensive official support by the observations management division of the observations department.

A fluxgate magnetometer was installed in 1989. Overhauser magnetometers and Fanselau-Braunbek Coils were purchased from 1990 to 1991. Test observations of

Overhauser magnetometers and construction of the computer system were completed in 1992. The technical description of the new system is summarized by Tsunomura et al. in this issue.

The routine observation by the new system started from April, 1993 and is going well. The new system was prepared well with many efforts of the staffs engaged in this project and the sufficient technical supports by the manufactures; Shimadzu Corp., GEM Systems Inc., GAUSS Corp. Japan, Kokusai Electronics Corp., Hirasawa Corp., Hakusan MFG, Systems Design Service Corp., NTT Data Communications Systems Corp. and Focus Systems Corp.. The system is now in long term operation on the way as the second generation of KASMMER, promising to supply high quality observational products.

References

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