

## The revision of archival magnetic data of the observatories of IKIR FEB RAS: actuality, progress and prospects

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The archives of the magnetic data of the observatories "Magadan" MGD, "Cape Schmidt" CPS, "Khabarovsk" KHB, "Paratunka" PET and "Yuzhno Sakhalinsk" YSS of IKIR FEB RAS, presented at WDC and INTERMAGNET and in local database of observatories, are considered. The hourly value datasets of MGD and PET in WDC contain the errors such as spikes and jumps and gaps for some years. Some available old data of CPS and KHB for past year are not published. Main progress with magnetic measurements is associated with INTERMAGNET status of observatories MGD, KHB and PET after 2011. A significant achievement was obtaining the digital images of analogue magnetograms of MGD (1998-2005, WDC for STP, Moscow) and PET (1967-2006, under financial support of VarSITI project). Revision of old magnetic data of IKIR observatories is necessary because they continue to be important for the scientific community. The work is carried out in the following areas: (a) the checking of hourly data, available in WDC, the correction of spikes and jumps; (b) the filling of gaps in analogue data using the images of magnetograms; (c) the filling of gaps using the some digital data, available after 2000.

Status of old magnetic data of observatories of IKIR FEB RAS (Figure 1):

- 1) data were published in WDC, but with errors (the checking and correction are needed);
- 2) data were published in WDC, but with gaps (the prepared data can be at observatory in local archives, the revision is needed);
- 3) the data has not been published (raw data can be at observatory, full processing is required, see Figure 2).

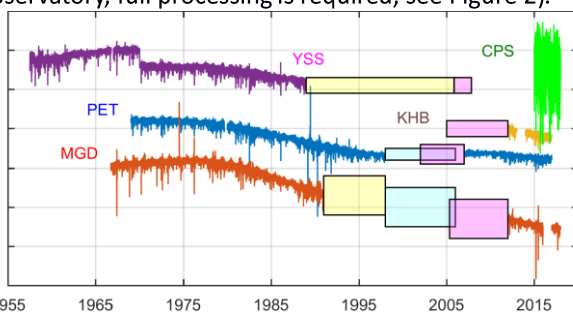


Figure 1: Status of magnetic data of observatories of IKIR FEB RAS (hourly values of horizontal component). Data up to 1998 are presented in the WDC (Edinburgh, Moscow), data of KHB, MGD and PET since 2007-2012 are presented in INTERMAGNET. The pink box shows periods with digital magnetometers, the blue box shows the presence of analog magnetograms (or their images), the yellow box indicates periods with an unknown data state.

The main problems:

- (a) a lot of noise of unknown nature, which can not be removed by software – manual processing is required;
- (b) there is no information about the temperature in the variation pavilion (there are single readings on the spirit thermometer during the photopaper changing);
- (c) there is no detailed information about the methods of absolute observations and the obtained results, including

the change from QHM to Dflux. It is assumed joint processing of hourly data from analogue magnetograms and digital data during the periods of joint measurements.

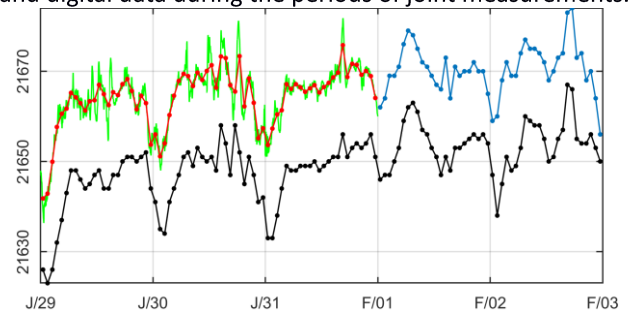


Figure 2: Example of filling of the gaps in the data of the observatory PET during 01-31 January, 1997 (horizontal component  $H$ , nT). Green curve—minute data obtained by digitization of the analog magnetograms (see Khomutov and Khomutova, 2016); red curve — hourly data calculated from minute values; blue curve — hourly values obtained by manual processing of magnetograms (from WDC); black curve — hourly data of observatory MMB (from WDC, for comparison).

One of the results – hourly data for 1991, 1996-1997 from the local archive of the Observatory "Paratunka" PET were checked and corrected. The missing data for January 1996 and January 1997 were obtained by digitization of analog magnetograms (Khomutov and Khomutova, 2016). The corrected files were transferred to the WDC (Edinburgh, Moscow).

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### References:

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