Interactive
Comment

Interactive comment on "Protection against lightning on the geomagnetic observatory" *by* R. Čop et al.

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Thanks for your valuable feedback. I appreciate your interest for the paper. I'm glad to hear you that the subject is of interest for observatory practice usage. I am looking forward further improving the article, making it helpful for end readers.

I believe that the overvoltage protection for sensible instruments is of wide interest. Consequently, I ended up in a dilemma who will be reading the article and what background the readers will have. Therefore, I decided I would describe the solution we implemented in detail, but still within the provided article limits. This is why I outlined the basics of lighting formation and later concentrated to the overvoltage protection.

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Interactive Discussion

Discussion Paper

We used knowledge of formation of lightning to prepare the project, to explain the effects of strokes of lightning after the implementation of new overvoltage protection and at list for searching the adequate reserve location for our observatory in our conditions. These three steps are divided by repetition of the most usable instruction word-by-word. The chapter 'Formation the lightning' can be improved or even skipped if exist only interest in the technical part and not to the background.

The equation of voltage $e_i = q / C$ [As/F] is provided as it is to outline the dynamic observation; later in the text, the equation is explained in more details.

The equation $u_i = -k \, 1/L \, dI/dt$ is presented in text in the wrong way because I used unsuitable equation editor. I am sorry for the confusion this may caused. If the final form of this equation of induced voltage $u_i(t)$ is used in a ratio than the coefficient k is eliminated. If the time-variation of the lightning currents is approximately equal than the evaluation of influence of each separate lightning stroke N_x on the measuring instrument is N_x/N_9. The value of $I_9 = 106.3$ kA is taken as starting point. This is the current of event N_9, which destroyed the electronic part of variometer. In this case the ratio is $N_x/N_9 = u_{ix}/u_{i9} = L_9/L_x \, I_x/I_9$ and the influence of separate lightning strokes of the treating thunderstorm are presented in last column of Table 2.

Figure 1 and Figure 2 are added as information for the reader. More details can be find out on internet or in the literature covering the topics. The same is valid for explanation of statistical data of system SIGNAL presented in first chapter, second chapter, Table 1 and in Figure 3. We use this knowledge of statistics for presentation to insurance company the new degree of risk on our observatory achieved by new overvoltage protection.

Best regards, Rudi Čop

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