

## Search for astrophysical nanosecond optical transients with TAIGA-HiSCORE array

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A wide-angle Cerenkov array TAIGA-HiSCORE (FOV  $\sim 0.6$  ster), was originally created as a part of TAIGA installation for high -energy gamma-ray astronomy and cosmic ray physics. Array now consist on nearly 100 optical stations on the area of  $1 \text{ km}^2$ . Due to high accuracy and stability ( $\sim 1$  ns) of time synchronization of the optical stations the accuracy of EAS arrival direction reconstruction is reached  $0.1^\circ$ . It was proven that the array can also be used to search for nanosecond astrophysical transients of the optical range. The report discusses the method of searching for astrophysical transients using the HiSCORE array and demonstrates its performance on a real example of detecting signals from an artificial Earth satellite. The search for optical transients in the HiSCORE data of the winter season 2018-2019 is carried out. One candidate for repeated transients has been detected, but the estimated probability of random simulation of such a transient by background EAS events is not less than 10%, which does not allow us to say that the detected candidate corresponds to a real astrophysical transient. An upper bound on the event frequency of optical transients with an optical quantum flux density of more than  $1.5 \times 10^{-4} \text{ erg/sec/cm}^2$  and a duration of more than 5 ns is established as  $\sim 2 \times 10^{-3} \text{ events/sr/hour}$ .

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