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Calibration system of EAS Cherenkov arrays using commercial drone helicopter

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EAS Cherenkov arrays are a powerful instrument for studies of primary cosmic rays in a wide range of energy. In this approach the Earth's atmosphere is used as a calorimeter providing EAS Cherenkov arrays high energy resolution. Another advantage of the method is its high time resolution which results in a good angular resolution. Usually EAS Cherenkov array is a sparsely instrumented array with a distance of 100 m (or more) between individual Cherenkov photon detectors (optical stations/modules) covering hundreds of square meters or a few thousands of square kilometers. So, to calibrate such arrays is not simple task. We developed a calibration system of EAS Cherenkov arrays based on a single fast light source on board of remotely controlled commercial drone helicopter. The light source is based on a single high power blue InGaN LED driven by avalanche transistors driver. The light source provides light pulses with 2-3 ns (FWHM) width and 1010-1011 photons per pulse. Preliminary results of test flights of the calibration system are presented. Preliminary results of calibration measurements of Cherenkov arrays of the TAIGA experiment using described calibration system are presented too.

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