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Detection of extensive air showers with the NEVOD-EAS cluster type detector

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At the experimental complex NEVOD-DECOR (MEPhI, Moscow), investigations of muon bundles at different zenith angles are based on the analysis of the local muon density spectra (LMDS). However, this technique of primary particle energy estimation has rather low accuracy ($\sigma(lgE0) \sim 0.4$) due to contribution of extensive air showers of different energies registered at different (random) distances from the axis to the events with a fixed local muon density. The deployment of a shower array around the NEVOD-DECOR complex for detection of EAS by means of a traditional method in the energy range $10^{15} - 10^{17}$ eV would allow to determine the shower size, its arrival direction and axis position and therefore to decrease the uncertainties of primary energy estimations obtained by means of the LMDS technique.

In 2015, the central part of the NEVOD-EAS shower array was created and launched into operation. The measuring system includes 5 clusters (with characteristic dimensions of about 20×20 m^2) of 16 scintillation counters of particles of the EAS electron component. The total area of the NEVOD-EAS central part is about 10^4 m^2.

The results of the study of the responses and temporal characteristics of the NEVOD-EAS central part clusters, critical for the reconstruction of shower parameters, as well as the examples of events registered by the shower array jointly with the NEVOD-DECOR setup are presented.

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