

First results of optical wide-band filter production proposed for the AUGER Fluorescence detectors

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The wide-band optical UV filters present an opportunity for greater signal to noise ratio in EAS detection by the air fluorescence technique, since they have been produced for the first time in a custom made industrial production mode and match the desired spectral properties. The present paper describes and offers a complete experimental setup for quality assurance and test of a large number of commercially produced UV filters. We present preliminary results of the evaluation of an industrial custom made production of such 75 optical filter pieces made by Optical Coating Japan. The filter pieces tested have nearly 92% peak transmittance between 320-400 nm for an angular range of incidence of 0-30 degrees on the filter plate (nearly 80% average), and typically less than 1% transmittance in the range 400-700 nm in the above angular spread.

The spectral transmittance of the filter pieces in either signal of the EAS fluorescence, emulated artificially, and in optical noise, typical of night sky radiation, have excellent repeatability. An assembly method to prepare an approximation of the spherical filter surface to be placed for tests in front of the pmt array of the Fluorescence Detector telescope, is presented as well as status of the assembly work. Such a configuration presents a cost effective solution since it requires nearly 4 times less filter surface and does not suffer in optical aberrations from possible effects of diffuse transmittance in comparison with filter pieces placed on the diaphragm, which is located more than 5 meters away from the camera focal plane.