

PERFORMANCE TEST OF A SMALL-SCALE PROTOTYPE OF FRESNEL OPTICS FOR COSMIC RAY OBSERVATION

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For optical detection of cosmic ray, the optics should have a wide-field system. And the system doesn't need a severe angular resolution like an astronomical telescope, so we can use a refracting optics which mechanical assembly may be looser than a reflecting optics. As a refracting optics, Fresnel lenses provide large-aperture and wide-field systems with drastically reduced mass and photon absorption. Such an optical system is adopted as the basic design of EUSO. Now we are developing a small-scale prototype of Fresnel optics, to establish a large-aperture, wide-field refracting optics. This optics has two plastic Fresnel lenses, which are 40cm diameter. These are cut on a spherical substrate and have grooves in both sides. We report two results of optical tests. One is the result of focusing test using visible lasers. The other is the observation result of Čerenkov light of Air Shower and backscatter light of ultraviolet laser.