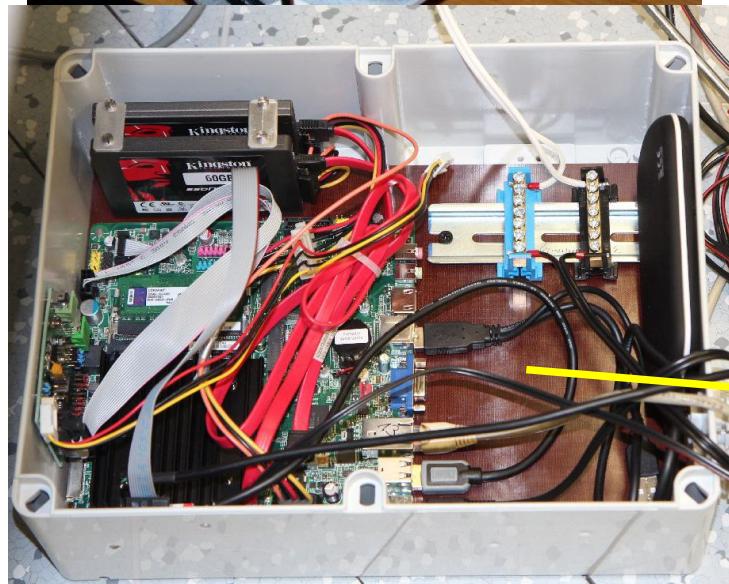
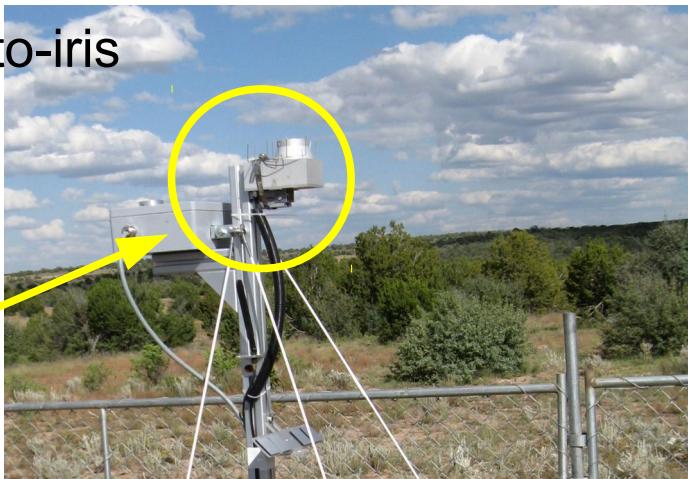


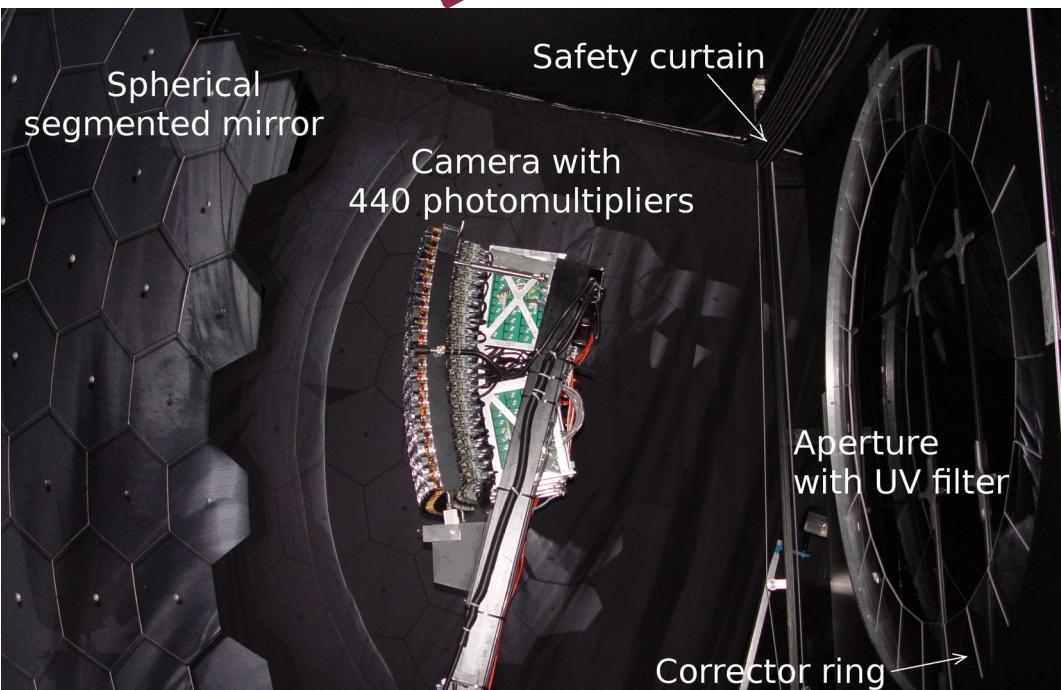
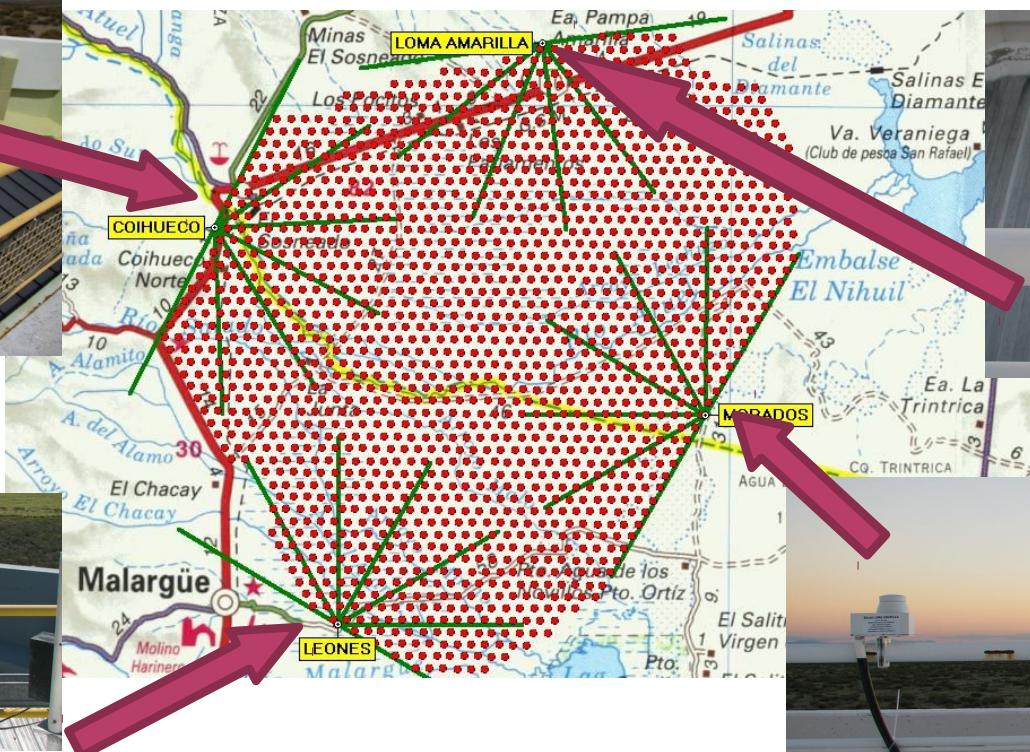
All Sky Camera instrument for night sky monitoring

Dušan Mandát, Miroslav Pech

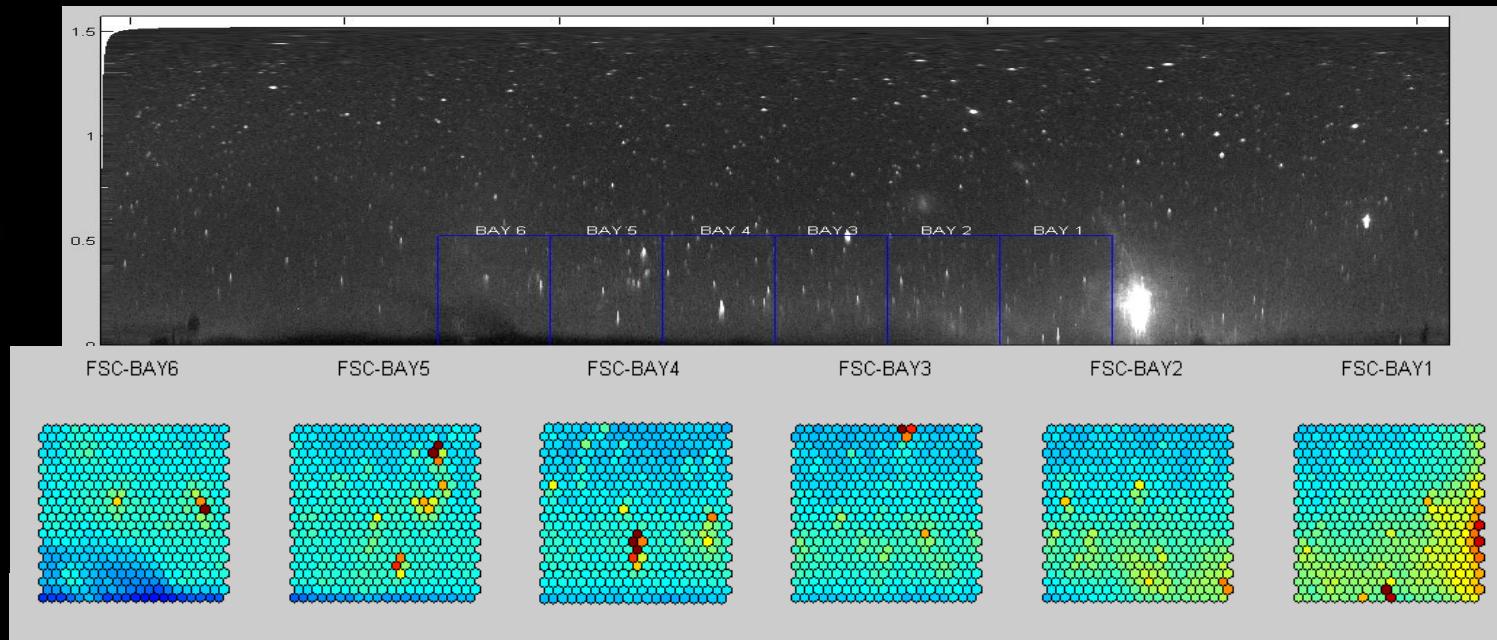
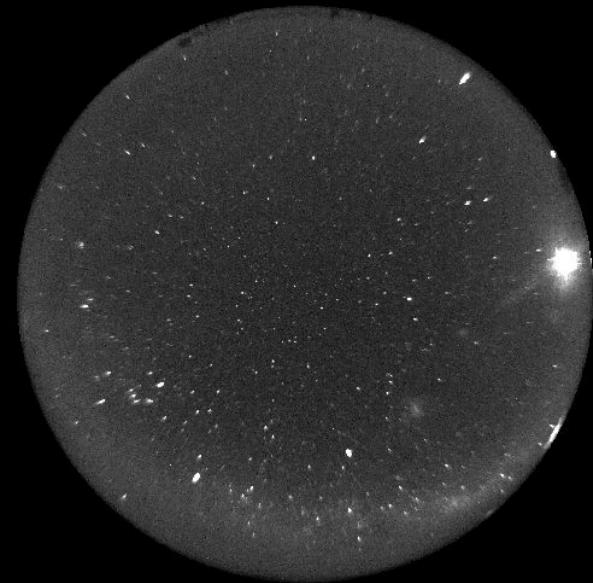
Institute of Physics of the Academy of Sciences of the Czech Republic

Camera: **G1-2000**, moravian instruments,mii.cz,
CCD chip **SONY ICX274AL**
Lens: allsky lens **Fujinon yv2** with auto-iris

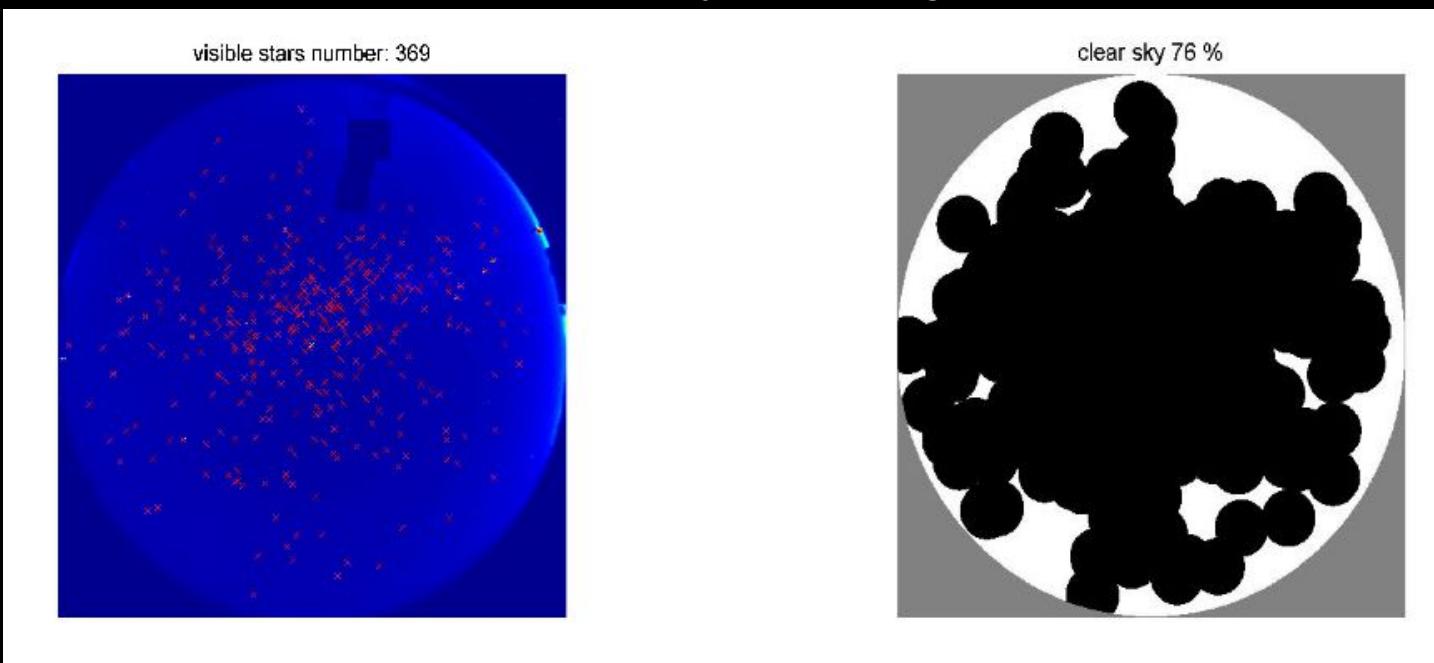




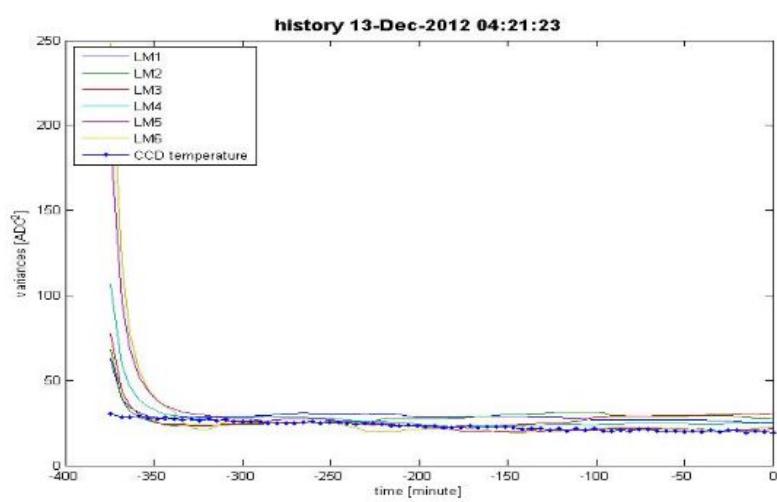
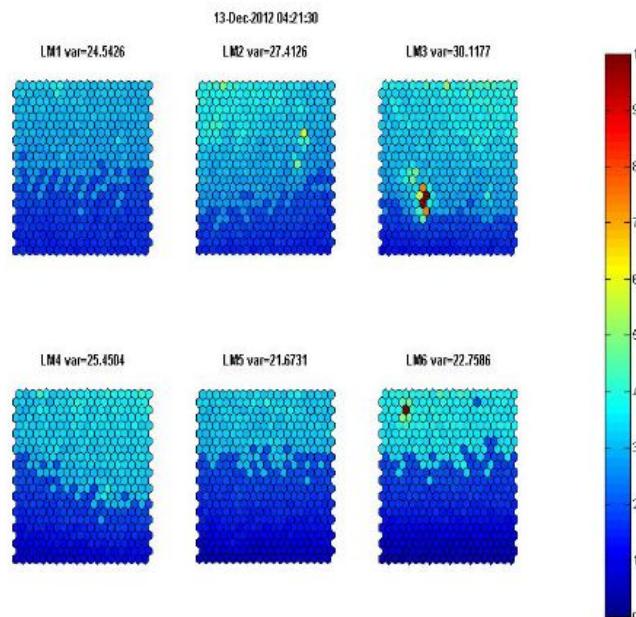
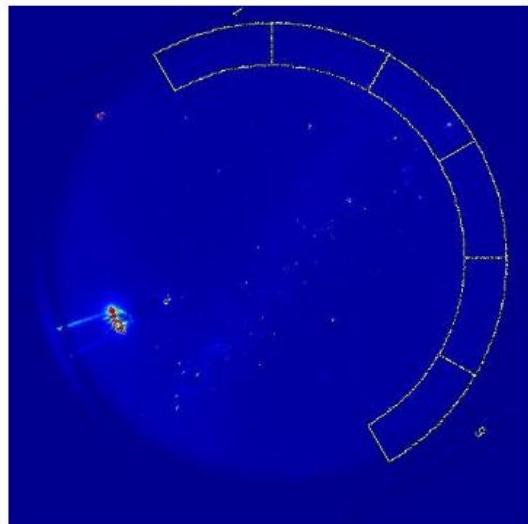
BGcam for AUGER



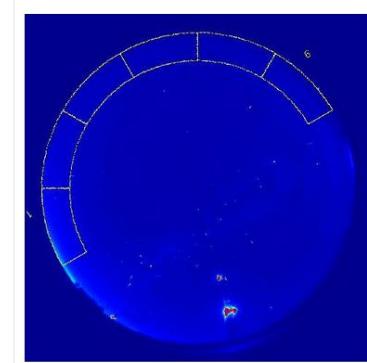
Clouds analysis for Auger



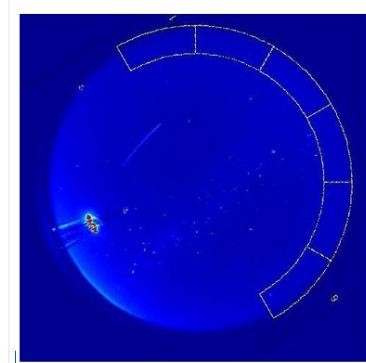
Full Sky Background Camera - Los Morados



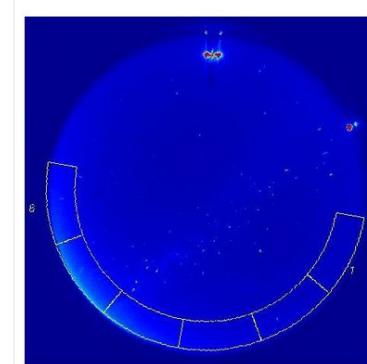
LOS LEONES



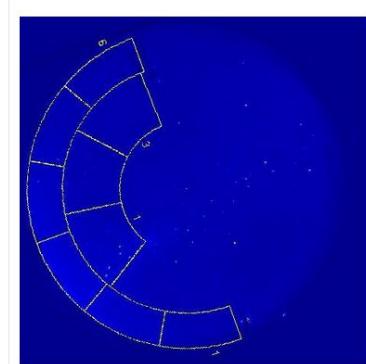
LOS MORADOS

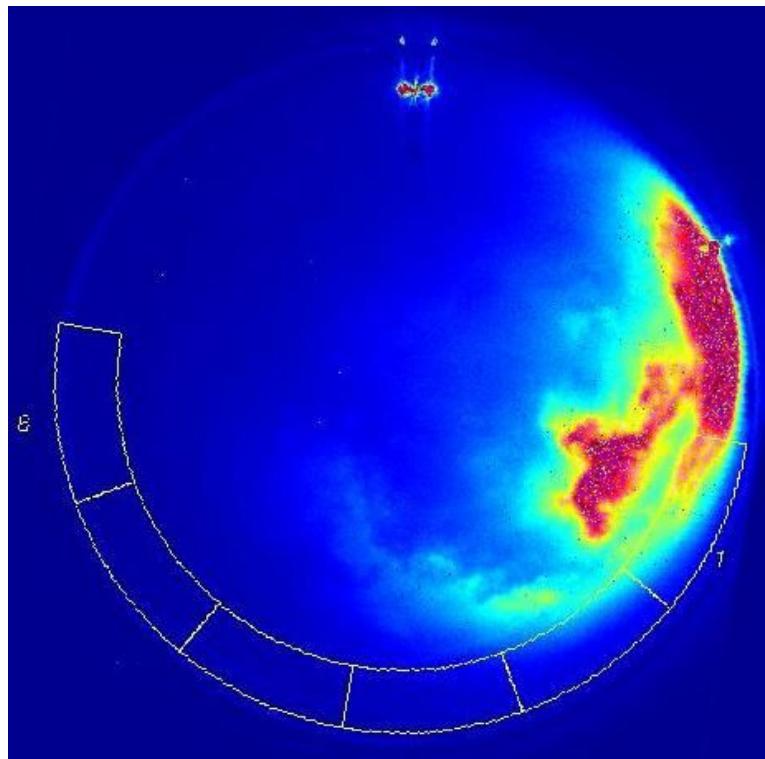


LOMA AMARILLA



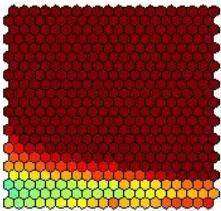
COIHUECO



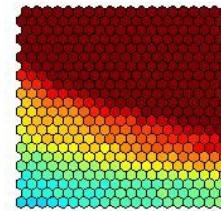


08-Nov-2012 23:43:45

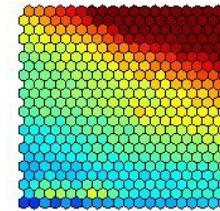
LA1 var=250.7125



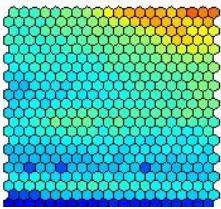
LA2 var=137.8671



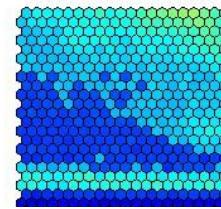
LA3 var=60.7989



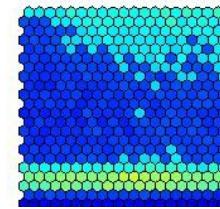
LA4 var=39.9903



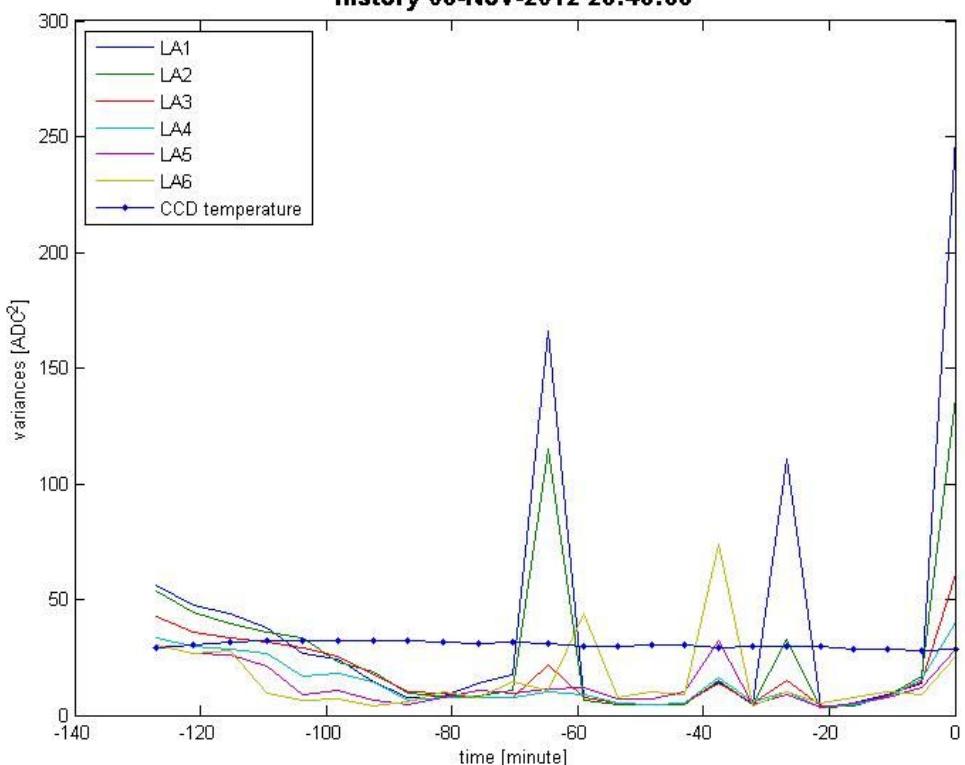
LA5 var=28.6046



LA6 var=25.4335



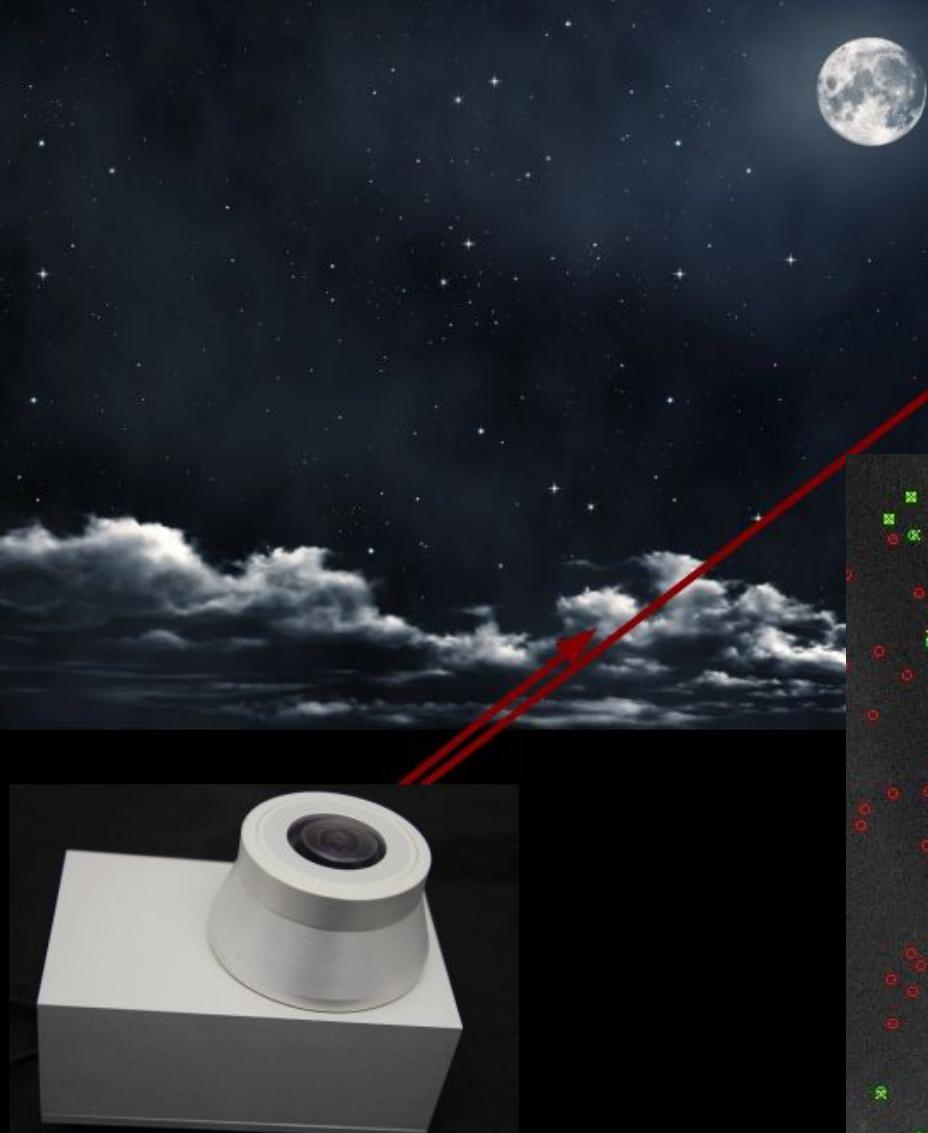
history 08-Nov-2012 23:43:38



ASC for CTA



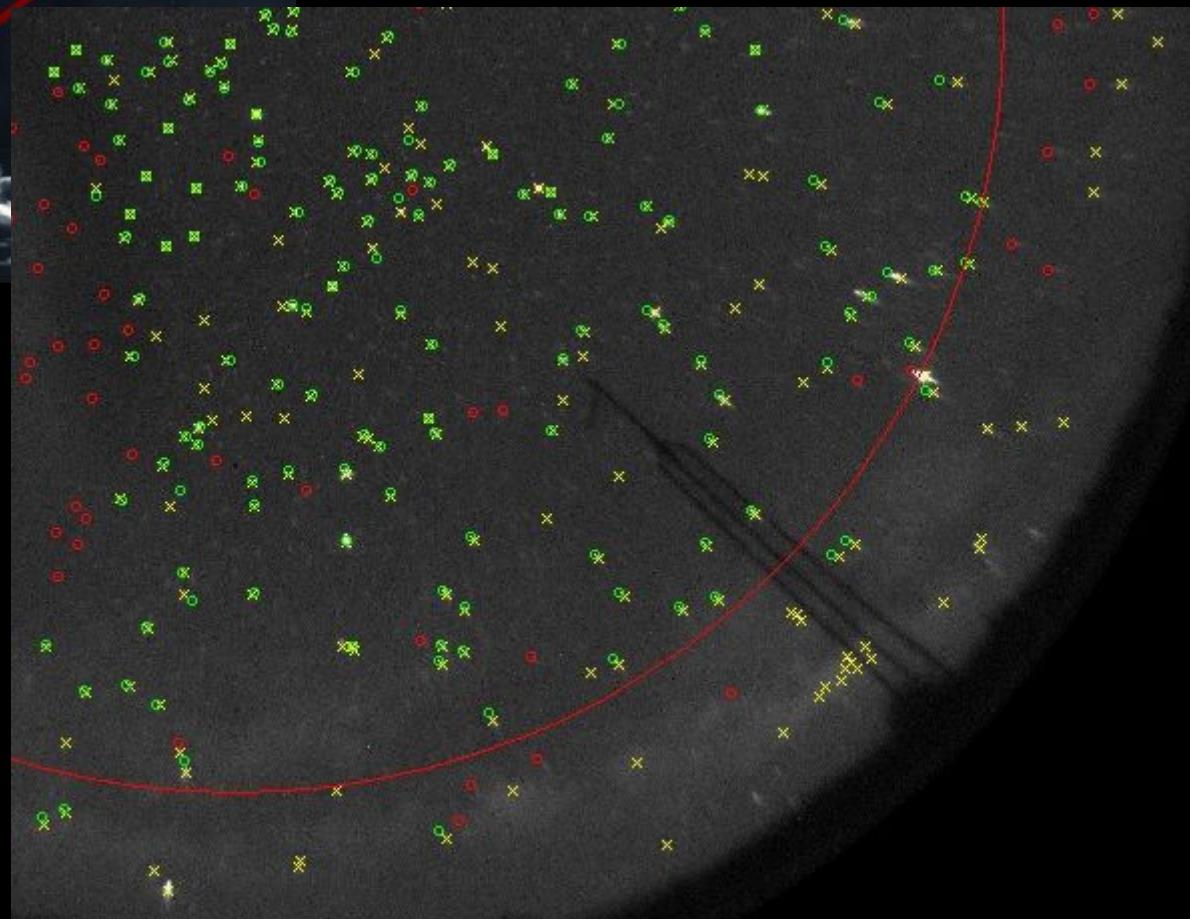
Cloudiness estimation principle

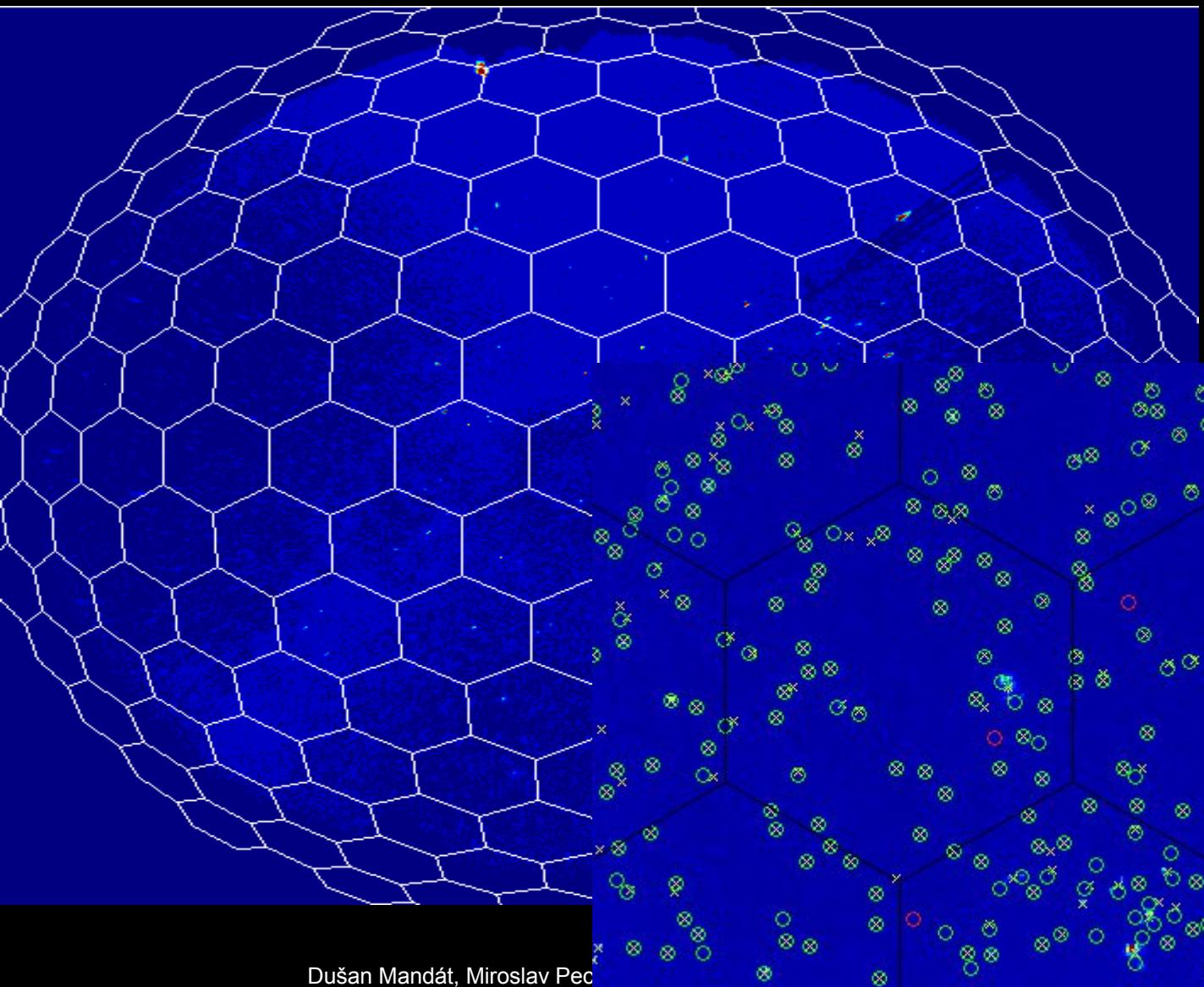


Clear sky – visible stars up to 6.3 mag (zenith).

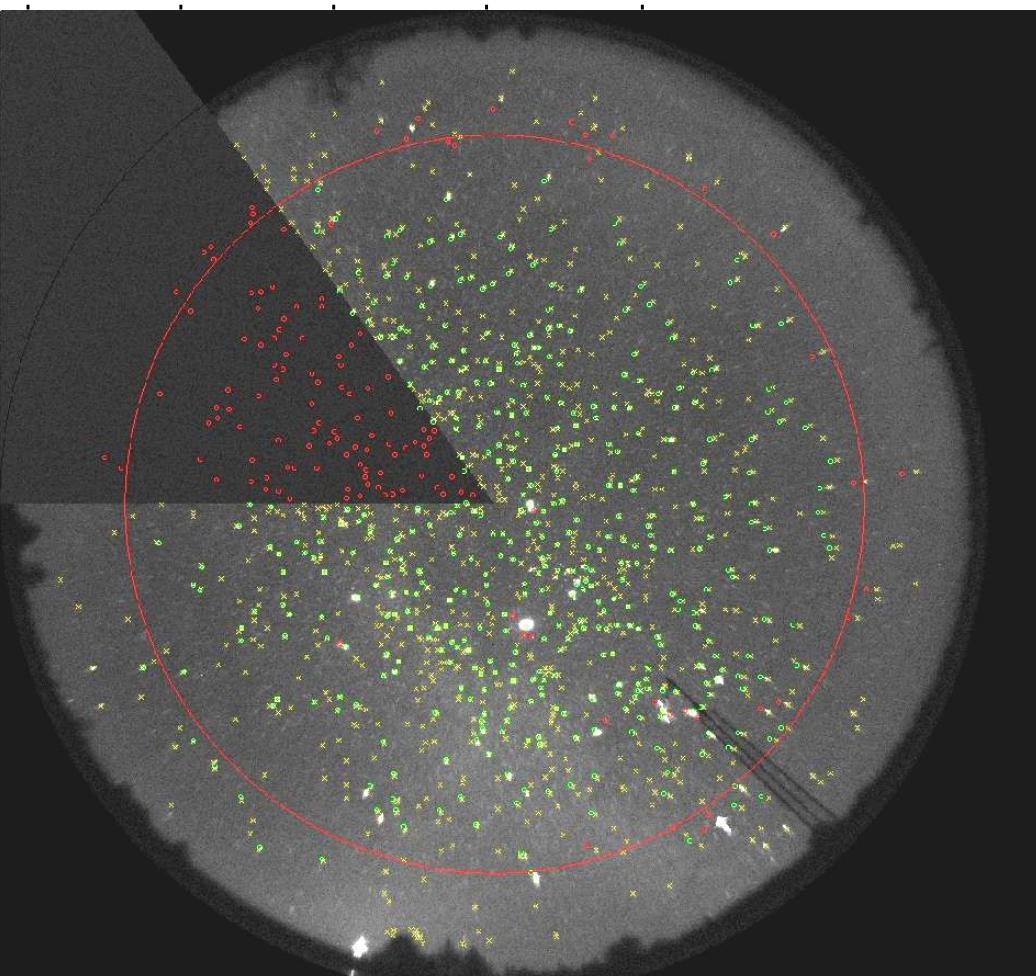
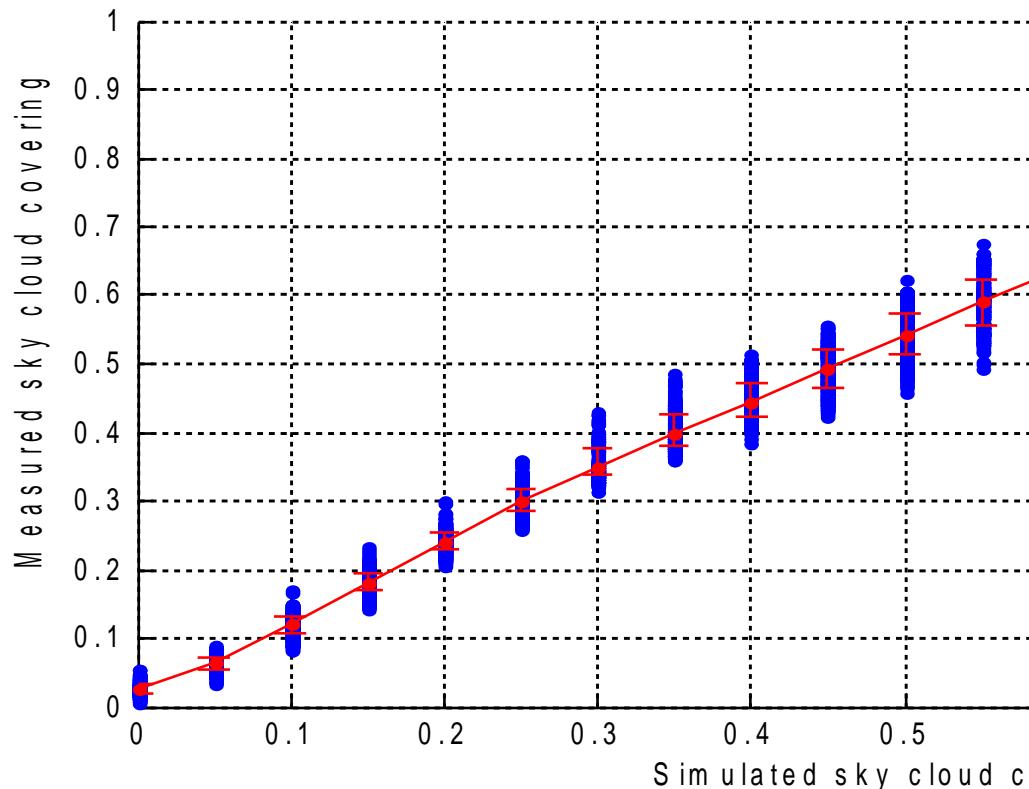
Partly covered – number of stars decrease
Covered sky – no star

Algorithm compares detected stars with catalogue stars



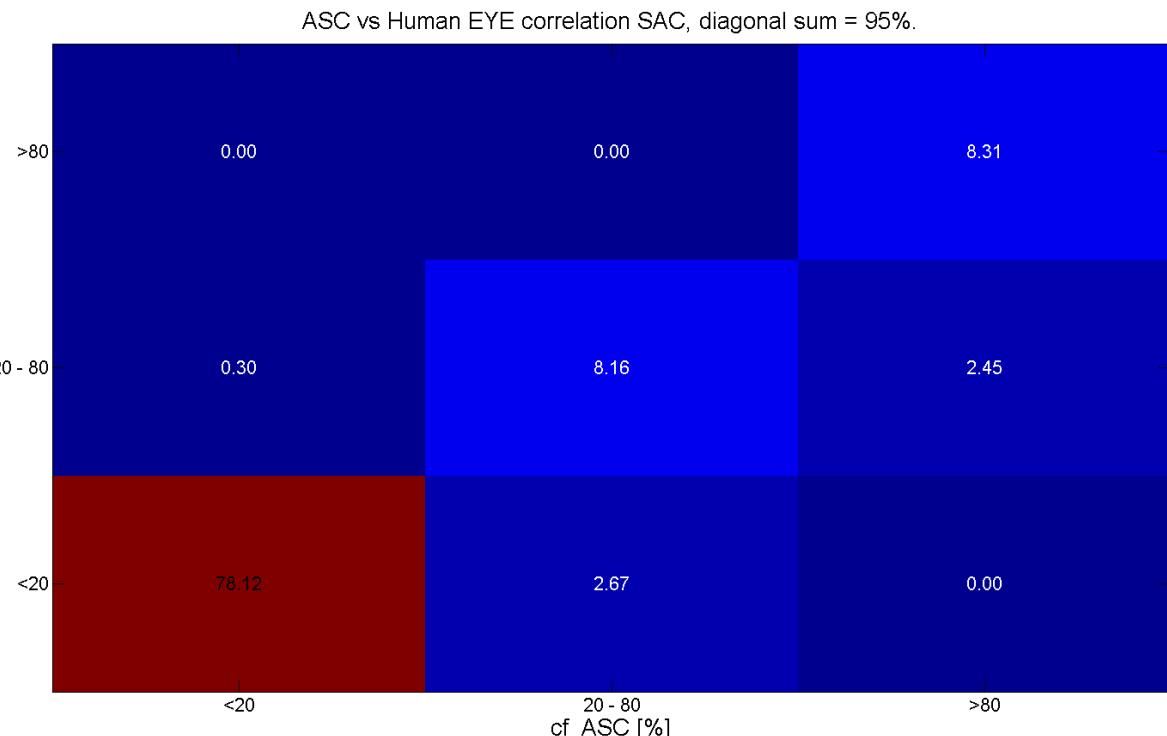


Night sky is segmented to a number of hexagonal areas, the star pairs (catalogue x detected) are searching within each area. The transform function is calculated for each CTA site.

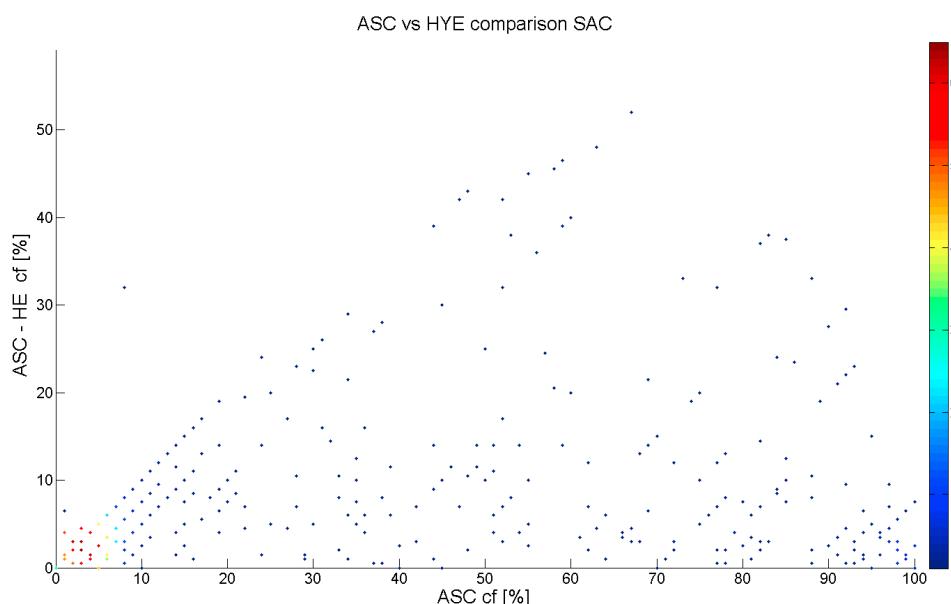


simulation of clouds

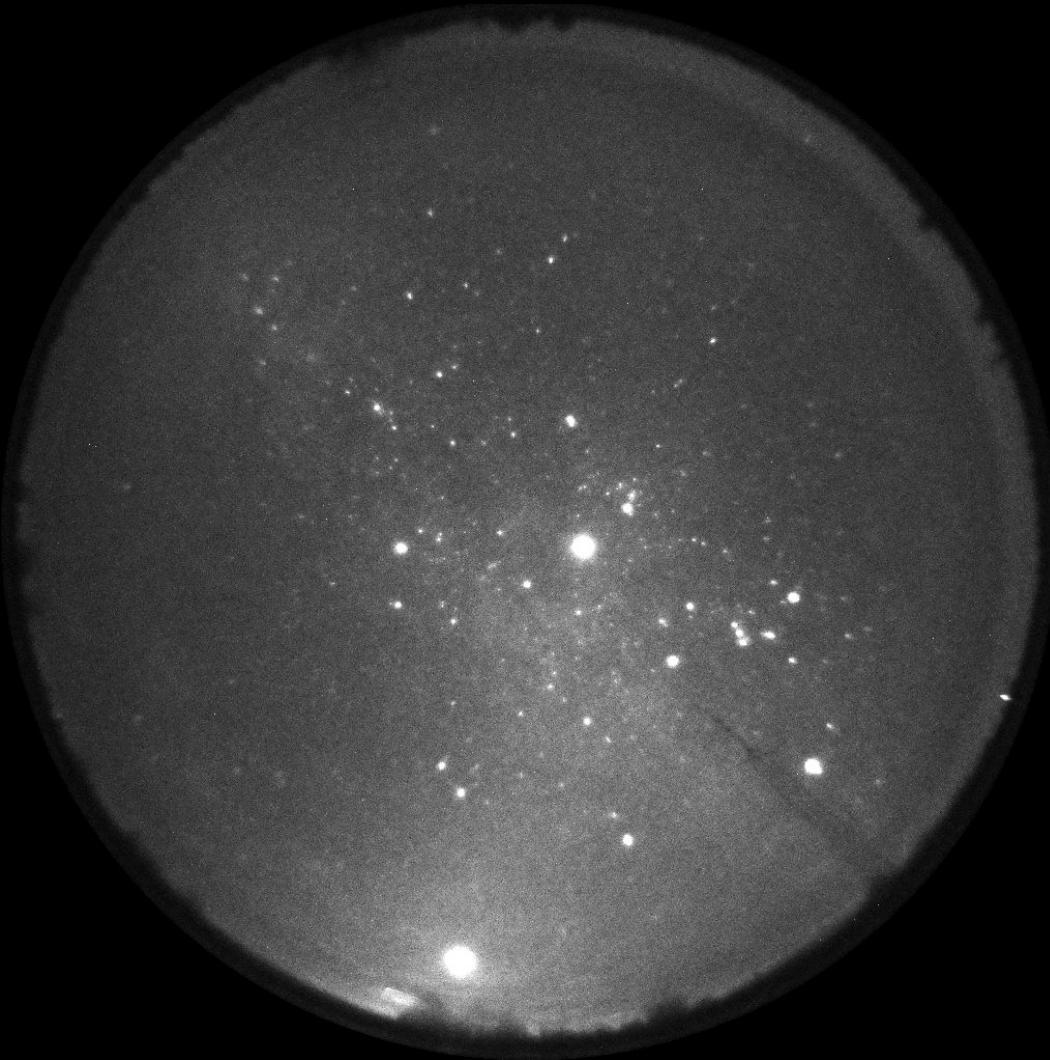
- 350 images of clear sky
- radial covering of the sky (step 5 deg)
- Error of the analysis :
 - cf_error (0 – 20 %) < $\pm 2\%$
 - cf_error (20 – 80 %) < $\pm 5\%$
 - cf_error (80 - 100 %) < $\pm 5\%$



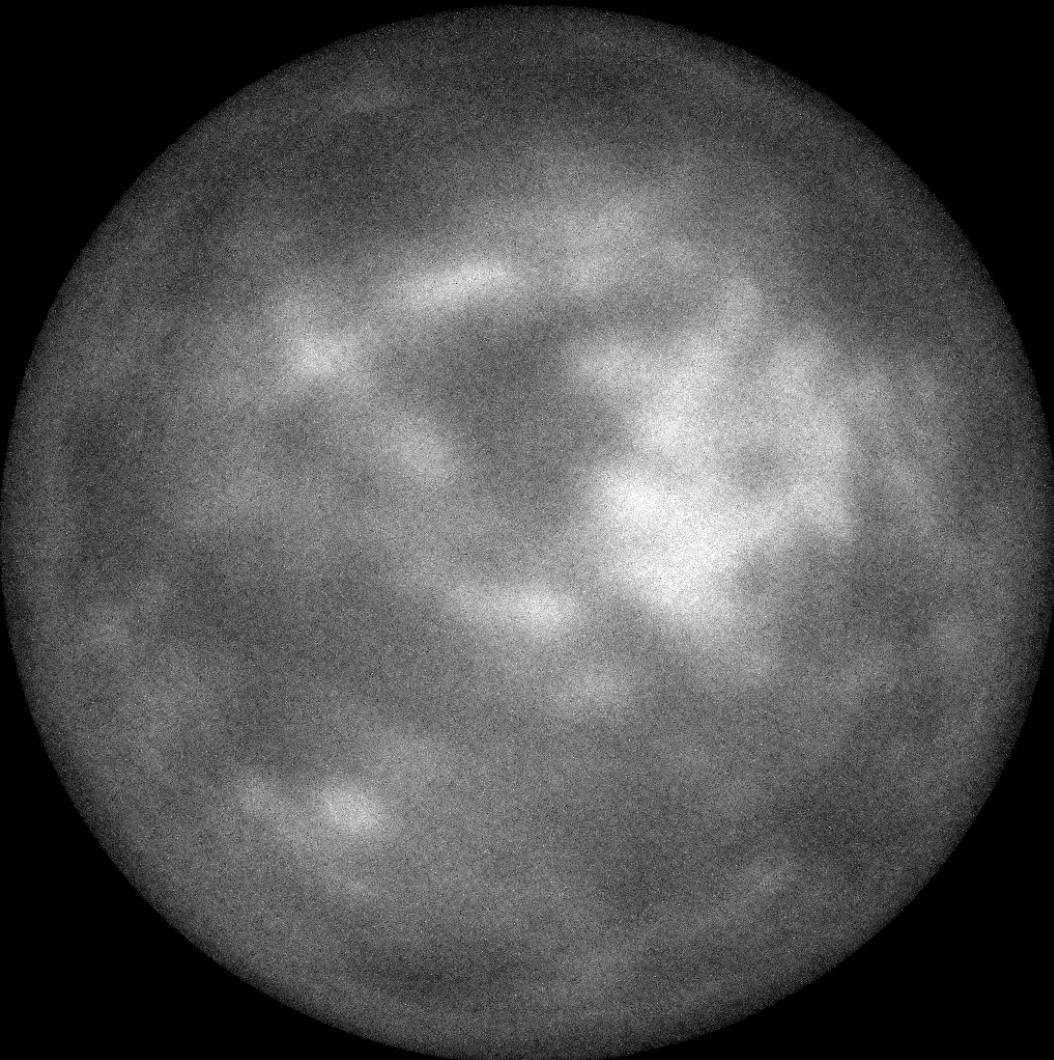
Human EYE validation



limitations

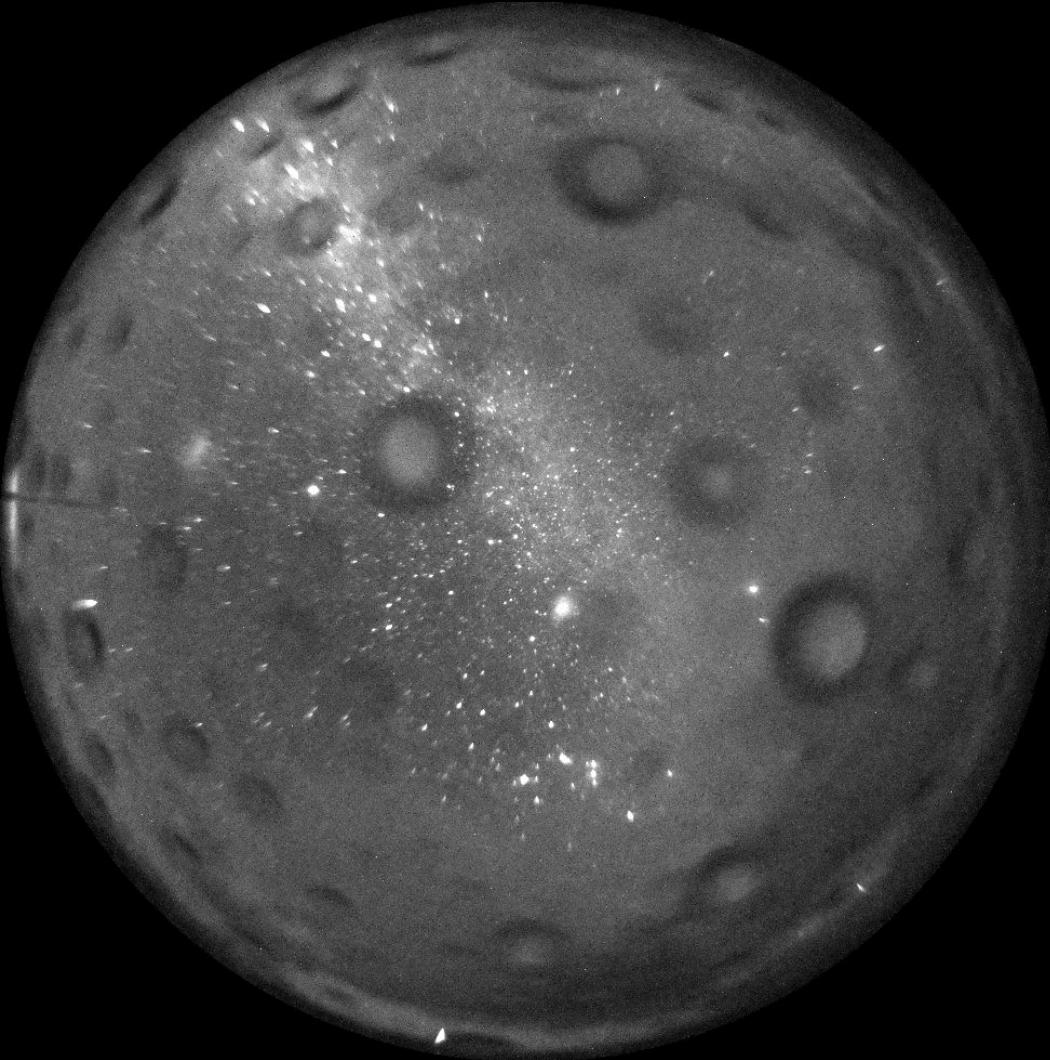


fog

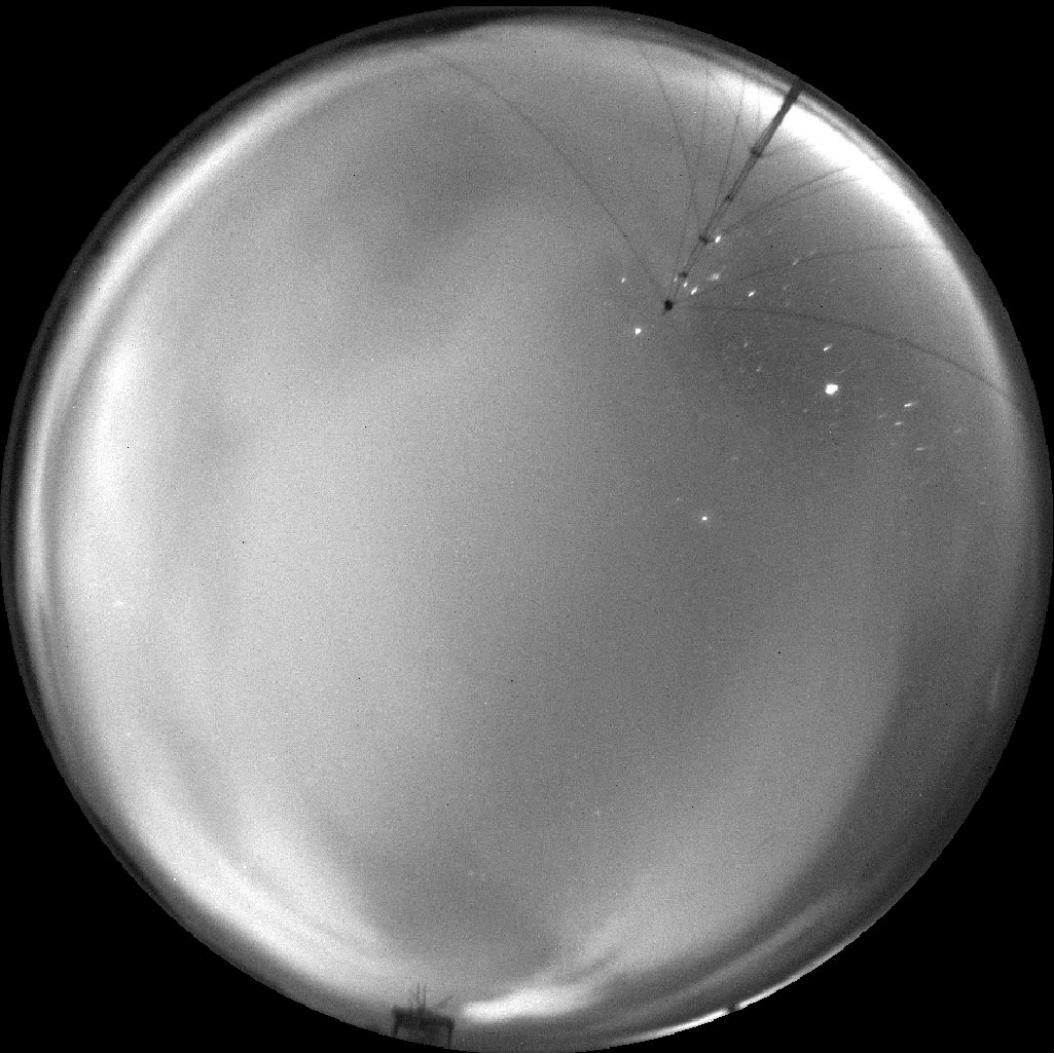


snow

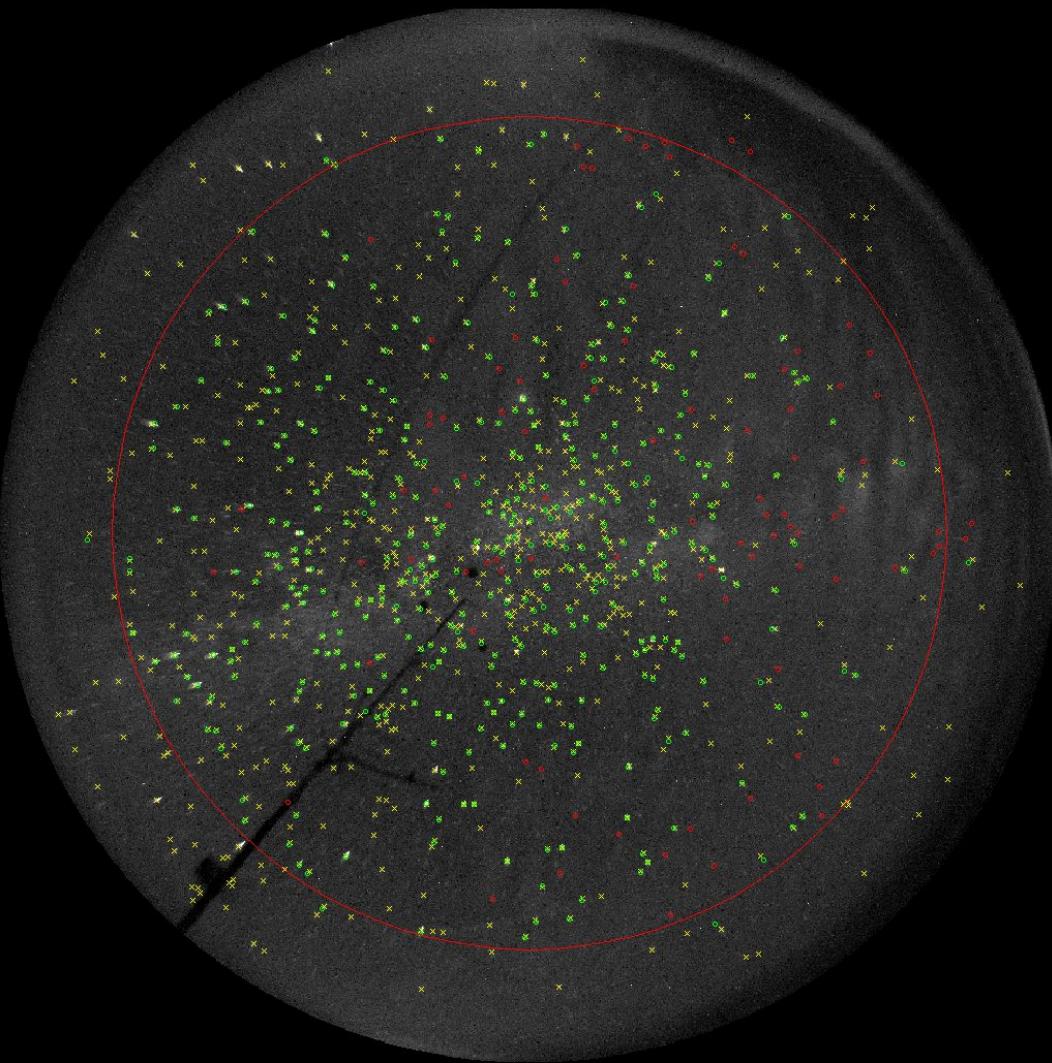
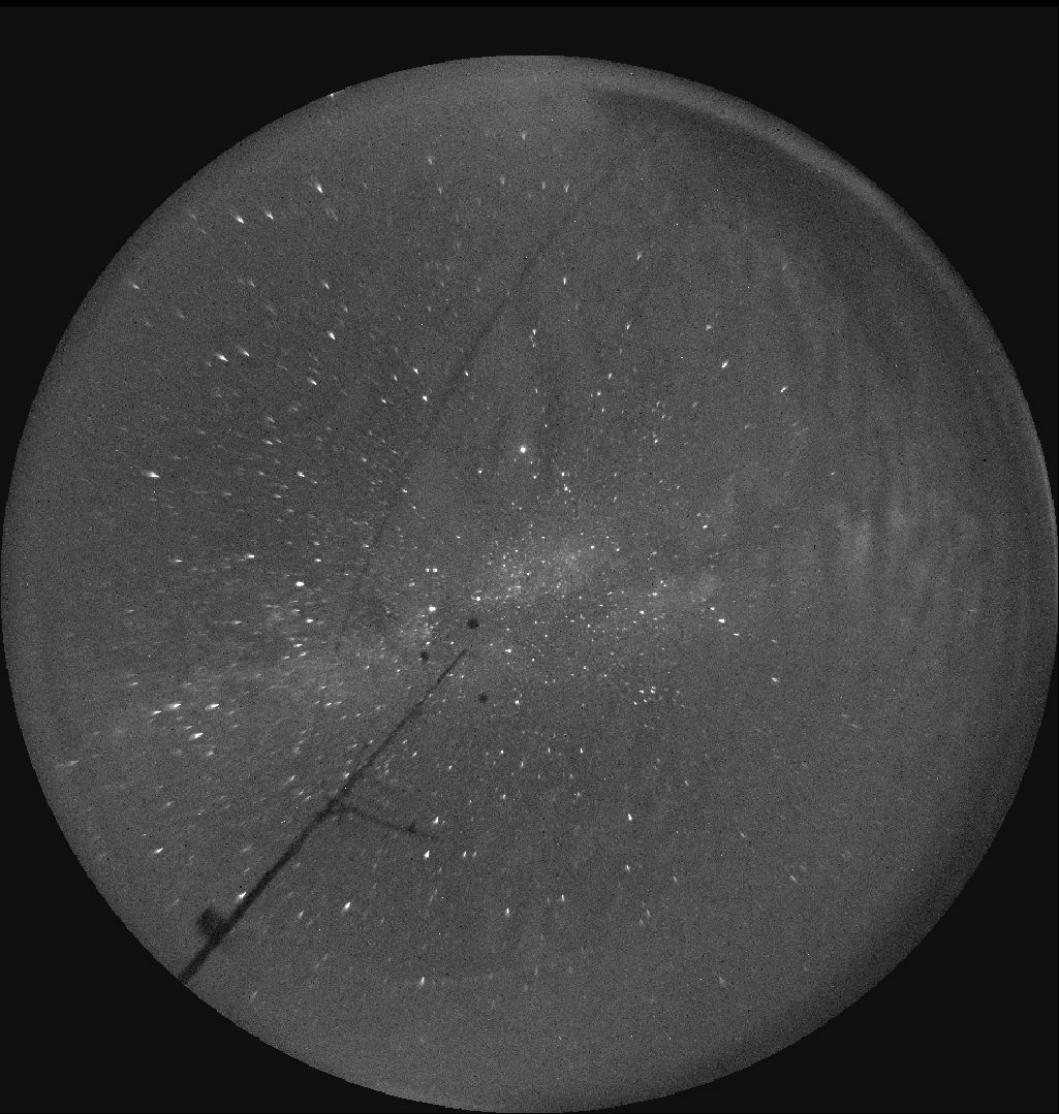
limitations

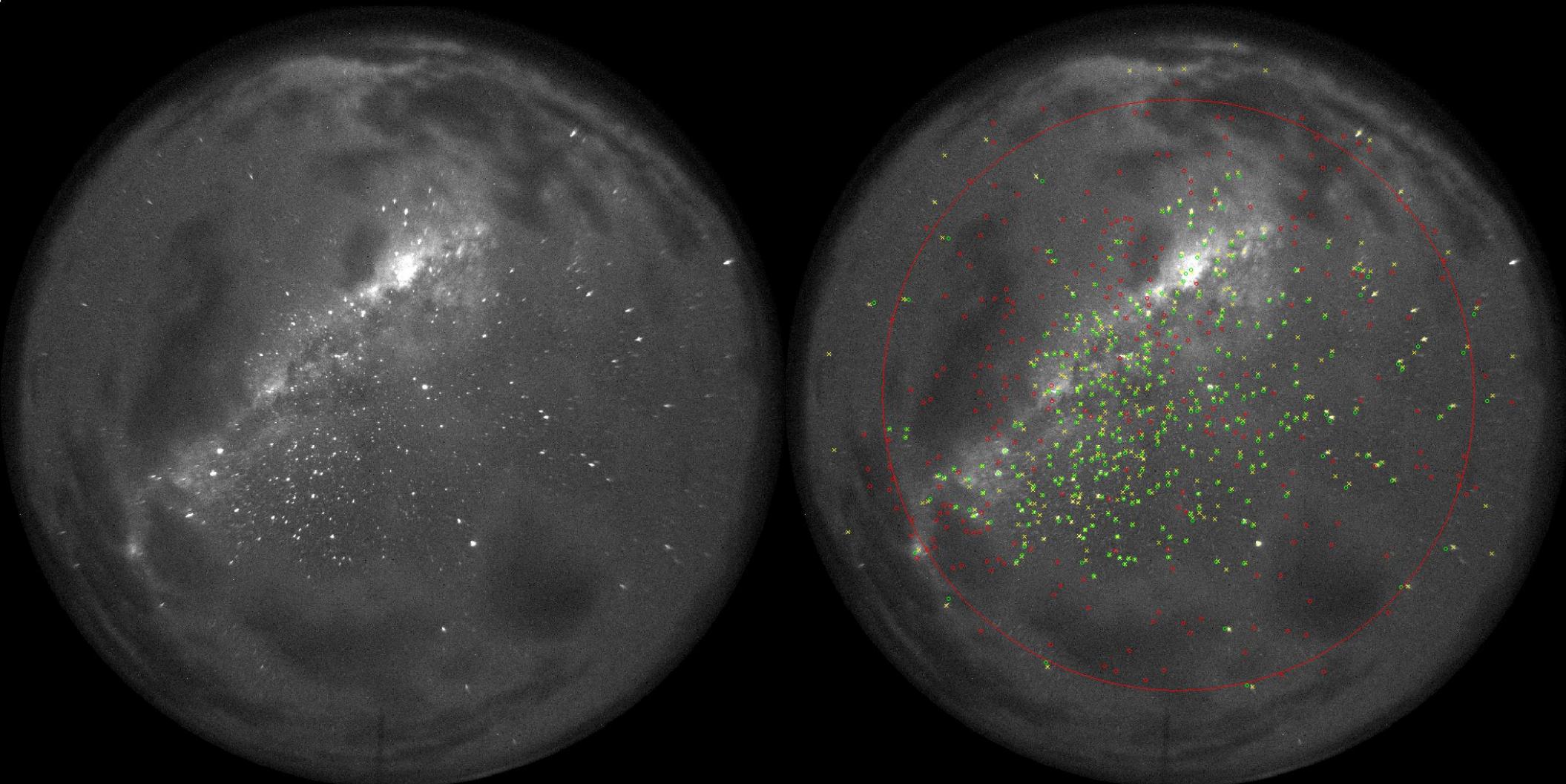


water



artificial light





Conclusions

- The BGcam for Pierre Auger Observatory was presented
- The camera could measure background light in the FOV of auger's FDs and cloudiness above the Pierre Auger Observatory
- The ASC for CTA and the cloudiness analysis was presented
- The HE validation shows high correlation was found
- The limitations of ASC analysis were discussed
- The system could be done as remote (CTA) or part of observatory (AUGER)