

The long-baseline SHABAR instrument

The long-baseline SHABAR (SHadow BAnd Ranger) instrument is a daytime seeing monitor. SHABAR's objective is characterizing the daytime turbulence distribution in atmospheric layers at different heights above the site where it is deployed.

Long-baseline SHABARs consist of 16 photodiodes which measure the sun scintillation, mounted at different distances in a 3 meter bar which tracks the sun. Each SHABAR includes the required electro-mechanical automatism and data acquisition stages including analog signal processing, analog to digital signal conversion, digital processing and data storage.

There are two functional long-baseline SHABARs in operation in the Canary Islands at present. They are usually deployed in two different sites: one in Observatorio del Teide (OT), in Tenerife island, and one in Observatorio del Roque de los Muchachos (ORM), in La Palma island.

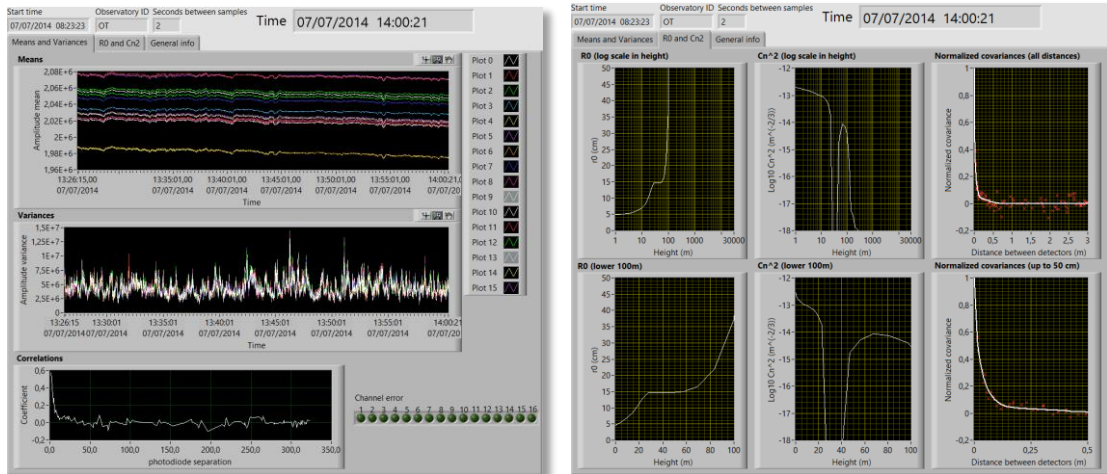


Long-baseline SHABAR software functioning and expected improvements

At present, the instrument software allows raw data acquisition from its photodiodes and generation of a mean and cross covariance preprocessed dataset derived from the acquired data. This preprocessed dataset generation is an intermediate step in the process of obtaining the seeing estimation, which is the final objective. The remaining computation is currently performed through the use of reduction routines external to the instrument software. These routines are applied offline to the files obtained for an observation after the observation has ended and not in an automatic way. This way of functioning does not allow real time seeing monitoring.

Taking all that information into account, the following tasks and improvements are being or planned to be developed in the incoming months:

- Addition of data reduction to the instrument software in order to monitor seeing in real time
- Enhancement of quality, publication and accessibility of the final seeing data
- Study and interpretation of the obtained and reduced data, adding complementary information variables as weather or time of the year



Besides the data acquisition software, some improvements in the instrument electro-mechanical automatism and control are also under study for future observation campaigns.

Long-baseline SHABAR field tests

Validation field tests for both instruments are in progress currently. These tests include:

- Parallel working of both instruments in the same site and at the same height, with the aim of detecting possible inconsistencies in the acquired data and correcting them if they appeared
- Parallel working of both instruments in the same site at different heights, in order to check the coherence of the acquired data and estimate the importance of the effect that surface air turbulence has in the acquired measurements

