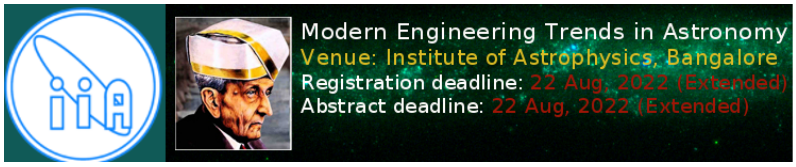

Contribution ID: **40** Type: **not specified**

Profilometry of large optical surfaces with under-sampled data using compressive sensing

Extremely large telescopes such as Thirty Meter Telescope (TMT) have their primary mirror as segments made of a large number of single mirrors. It is a challenge to polish such mirrors, especially the profilometry part. Surface profile measurements are taken at low, mid and high special frequencies. Obtaining highly accurate measurement data to cover the whole surface with contact and contactless methods is a challenge. Here we discuss a novel method to obtain the whole profile of the surface from under-sampled data. The compressive sensing algorithm utilizes sub-sampled data to reconstruct back the original surface. The algorithm is simulated and modelled on a 1.5-meter diameter mirror, the same that is used in TMT. A 2D profilometer is used to capture sampled data from the surface of this mirror and later is stitched to reconstruct the surface profile. Here we compare the results obtained after stitching as well as using a compressive sensing algorithm. This method can be extended towards the measurement of high special frequency data as well. We have simulated and modelled the surface from under-sampled high-frequency data as well. The results of the same are also discussed in detail along with the methodology followed in the algorithm

Presentation type

Poster

Primary authors: VALSAN, Vineeth (Christ University); Dr PANCHAL, Pramod (Indian Institute of Astrophysics); Mr BASHEER, Alikhan (Indian Institute of Astrophysics); Mr S, Sriram (Indian Institute of Astrophysics)

Presenter: VALSAN, Vineeth (Christ University)