

Ramya Anche



Title

Determination of polarimetric capabilities of the Thirty Meter Telescope

Abstract

The polarization model for one of the future generation telescope, the Thirty Meter Telescope (TMT) will be presented. The polarization ray tracing model gives the complete Mueller matrices of all the mirrors of the telescope. The instrumental polarization and crosstalk

are found to be varying significantly with the field of view of the telescope, zenith angle, and the position of the instrument ports due to the inclined tertiary mirror of the telescope. We also propose a design to mitigate the effect of polarization arising from the Nasmyth mirror by using an inclined mirror kept orthogonal to it. The polarization aberrations arising due to the non-normal incidences and coating has been calculated to ascertain its effect on the point spread function of the telescope. The effects of the segments and coating non-uniformities have been studied. These analysis will be useful for the design of the future polarimetric instruments for TMT.

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RESEARCH EXPERIENCE:

STEWART OBSERVATORY, UNIVERSITY OF ARIZONA | POSTDOCTORAL RESEARCH ASSOCIATE |

Oct 2021 – Current | Tucson, USA

- Roman Coronagraph debris disk observation simulation
- Modelling and simulation of polarization aberrations for the Space coronagraph systems.

INTER-UNIVERSITY CENTER FOR ASTRONOMY AND ASTROPHYSICS | WALOP POSTDOCTORAL FELLOW

November 2020 – April 2021 | Pune, India

- Characterization of CCDs used in the Wide-Area Linear Optical Polarimeters for the PASIPHAЕ survey.

INTER-UNIVERSITY CENTER FOR ASTRONOMY AND ASTROPHYSICS | VISITING RESEARCHER

March 2020 – September 2020 | Pune, India

- Polarization modelling and calibration of the Wide-Area Linear Optical Polarimeters for the PASIPHAЕ survey.

NATIONAL ASTRONOMICAL OBSERVATORIES OF CHINA | RESEARCH ENGINEER

July 2019 – Feb 2020 | Beijing, China

- Development of the polarization model for the Full Disk Magnetograph (One of the payloads of the Advanced Space Solar Observatory)

EDUCATION:

JAN 2020 | PH.D. (TECH) | THE UNIVERSITY OF CALCUTTA

THESIS TITLE: DETERMINATION OF POLARIMETRIC CAPABILITIES OF THE ASTRONOMICAL TELESCOPES

Institute: Indian Institute of Astrophysics, Bangalore

AUG 2014 | M.TECH : ASTRONOMICAL INSTRUMENTATION | THE UNIVERSITY OF CALCUTTA

CGPA: 9.01/10

Institute: Indian Institute of Astrophysics, Bangalore

JULY 2011 | B.E :ELECTRICAL AND ELECTRONICS | VISVESVARAYA TECHNOLOGICAL UNIVERSITY

PERCENTAGE: 86.81

PUBLICATIONS:

1. Analysis of polarization introduced due to the telescope optics of the Thirty Meter Telescope.
Ramya Manjunath Anche, Asoke Kumar Sen, Gadiyara Chakrapani Anupama, Kasiviswanathan Sankarasubramanian, Warren Skidmore & Skidmore, W., Journal of Astronomical Telescopes, Instruments, and Systems 4.1 (2018): 018003.
2. Preliminary design techniques to mitigate the polarization effects due to telescope optics of the Thirty Meter Telescope (TMT).
Ramya M. Anche, G. C. Anupama & K. Sankarasubramanian, Journal of Optics 47(2), 166-173, 2018.
3. Optical spectroscopic and polarization properties of 2011 outburst of the recurrent nova T Pyxidis.
M. Pavana, **Ramya M. Anche**, G. C. Anupama, A. N. Ramaprakash and G. Selvakumar., Astronomy & Astrophysics 622 (2019): A126.
4. Polarization model for the multi-application solar telescope at the Udaipur Solar Observatory
Ramya M. Anche, M. Ranganathan, Shibu K. Mathew, K. Sankarasubramanian, G. C. Anupama, Bireddy Ramya, Avijeet Prasad, Rahul Yadav, Raja Bayanna., Proceedings Volume 11451, Advances in Optical and Mechanical Technologies for Telescopes and Instrumentation IV; 114514O (2020)