

THIN FILM COATINGS FOR SPACE OPTICS

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Abstract

Muti-layer thin film coatings on precision fabricated optics such as mirrors, lens elements are essential to enhance the throughput of optical systems. Also thin film based optical components such as broad / narrow band filters, beam splitters and dichroics are used to split incoming beam either spatially and/or spectrally. In this talk, a variety of optical coatings over a wide spectral range from NUV to TIR which were developed at Thin Films Division, LEOS and used over the last two decades in Indian satellite systems shall be briefly touched upon. Also, functional coatings developed for stray light suppression, photomasks and conducting IR emissive surface shall be covered. Coating process standardization to meet space-qualification and MIL standard requirements is an essential aspect of development which shall be highlighted.

Bio:

Dr. M.V. Hanumantha Rao is presently Head, Reflective Optical Systems Group at Laboratory for Electro-Optical Systems – ISRO, Bangalore. Previous to this, he was a scientist and Head, Thin Films Division, LEOS where during the past 20 years he was directly associated with development of a variety of optical coatings required for space applications.

He obtained Masters degrees in Physics and Solidstate materials from IIT, Delhi and also M.S. from University of Nebraska-Lincoln, USA. His doctorate degree is from IIT, Kharagpur under the guidance of Late Prof. K L Chopra.

Before joining ISRO, he was scientist at CMET Pune where resistor pastes for HMC application were indigenously developed.

At ISRO, he was a member of science payload development team for Lyman Alpha Photometer of Mars orbiter mission and LIBS instrument of Chandrayan2 rover. He has published about 20 research papers on thin films science and optical fabrication, LAP and LIBS. He received ISRO team awards for LAP and for realization of 1-meter class optics. As Deputy Project Director, he has ensured realization of space optics for a couple of on-going projects. His professional interests are towards pursuing technology developments in optical coatings for electro-optical systems and science instruments.