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OPTICAL THIN FILM TECHNOLOGY APPLIED IN SPACE

**Abstract**

With the development of space technology, optical thin film was used more and more widely in space. This paper described several kinds of application examples of optical thin film technology synoptically, such as imaging optical system applications, non-imaging system and so on. Space environment influence(including vacuum, temperature change, charged particles, ultraviolet, atomic oxygen and so on) on optical thin film characters was introduced. Studied works on advanced technology of space optical thin film in National Key Laboratory of Science and Technology on Surface Engineering(NKLSTSE) were presented. For the use of space application, we studied and developed many kinds of optical thin film technologies, such as band pass filter, ultra-narrow band pass filters, linear variable filters, abrasion-proof optical thin films, photonic crystal optical filters and so on. Spectrum transmittance of IR band pass filter (10.33m 12.53m) in different temperature surroundings was studied. The characters on centre wavelength position drift of ultra-narrow band pass filters were tested. We also studied the design method and deposition technology of linear variable filters. In abrasion-proof optical thin films study, compound optical thin film technology was adopted. Photonic crystal design method was used for reference in our study.