

MATERIALS AND STRUCTURES SYMPOSIUM (C2)  
Poster Session (P)

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## THERMAL STATE OF SOLAR SAIL WITH STRAIN-DEPENDENT OPTICAL PARAMETERS

**Abstract**

Optical parameters of thin films such as reflectivity, absorptivity and transmittivity generally depend from mechanical strain in material. These phenomena weren't considered in solar sail applications yet. The paper includes experimental results of determination of optical parameters of thin film materials in uniaxial stress state under different loads for wavelengths from 405nm to 980nm. Experiments were done with Russian-made polyimide and PET films. Monte-Carlo simulation results for thermal state of Heliogyro solar sail are provided. This work is done as a part of development of BMSTU-Sail experiment which is planned to be held onboard of Russian segment of ISS.