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THE EFFECTS OF SPACE IONIZING RADIATION ON TRANSMISSION OF LANTHANUM
GLASSES

Abstract

A study of the effects of ^{60}Co gamma radiation on the transmission of lanthanum flint and lanthanum crown glasses is presented for application in space optics. The max total dose attained 10kGy, and the experimental results show that the visible transmission for all samples decreases, while the near-infrared transmission show a slight decrease. Although the transmission of the lanthanum flint glass LaF10 is the minimum of all samples before irradiation, it also shows a minimum transmittance loss after irradiation. The accumulated radiation total doses before and after a 10mm-thick Al shielded layer were simulated for the eight orbits of different altitudes in a 10-year-mission. The simulating results indicate that in the 3,000km, 6,000km and 10,000km orbit altitudes, a thicker shielded layer was required to reduce the total dose, while in the other five orbits, a 10mm-thick Al layer was enough for satisfying the optical system performance.