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Study of the optical properties of Aluminum zigzag thin films via transfer matrix

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Abstract

The transfer matrix method was adopted to solve the linearly polarized light propagation problem to study the occurrence of absorption transitions for Aluminum zigzag thin films. For different incident lights, azimuthal angles, arms number and lengths, the optical results showed that the intensity of absorption peak of s-polarization remains constant as the incident light angle was increased, while the intensity of absorption peaks for p-polarization was raised. According to the variations of spectra for different azimuthal angles, the results of p-polarization were opposite to those of s polarization. Also, changing the number of arms from two to three, three to four and four to five shifted the peaks of absorption spectrum towards longer (red shift), shorter (blue shift) and longer wavelengths (red shift), respectively. This behavior could be observed for the zigzag nano-structure with different arm lengths.

Keywords: Aluminum zigzag thin film, linearly polarized light, optical spectra, transfer matrix

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