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A new type Lyot filter insensitive to incident angle

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Abstract The shifting direction of a central wavelength for a quartz birefringent filter is found different when the filter is rotated around the axis parallel and perpendicular to the quartz optical axis in this paper. Based on this result, a new type of two-stage modified-Lyot quartz filter is presented, which show that the central wavelength of this new type Lyot filter is actually insensitive to incident angle through theory analysis when incident angle is less than 18°, and the maximum transmission decrease only about 66 % compared to normal incidence. Moreover, this conclusion is in good agreements with relative experiment results.

Keywords Incident angle · Quartz plate · Birefringent · Filter

1 Introduction

There are two classic types of optical birefringence filters: Lyot filter (Evans 1949; Aharon and Abdulhalim 2009) and Solc filter (Evans 1958; Solc 1965). Compared to other optical filters, the unique advantage offered by this birefringence filter is the tenability to a desired wavelength, low insertion loss and wide field of view. Thus, birefringence filters have been

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