

Issues with external occultation of a coronagraph

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Abstract This paper addresses some of the issues related to externally occulted solar coronagraph; vignetting and achievable resolution due to an external occulter. The analytical expression by Evans (J Opt Soc Am 38:1083–1085, 1948) is used to perform the initial calculations. An expression for the vignetting for a given external occulter and field angle is derived. The values obtained with the derived expression are verified with those obtained by ZEMAX an Optical design software. The degradation in angular resolution of the system due to vignetting is also presented and an empirical relation to calculate the normalized resolution for a given amount of vignetting is obtained.

Keywords Solar coronagraph · Coronagraph · Occultation · Vignetting · ZEMAX

1 Introduction

A solar coronagraph is a specialized telescope to observe the corona, which is a million times fainter than the solar disk in the visible wavelength region. Lyot

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