

平成 20 年 2 月 29 日

応用物理学会北海道支部
会員各位

応用物理学会北海道支部

講演会のお知らせ

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演題：Achromatic Interfero-Coronagraph with common-path to observe an extrasolar planet: images from demonstrator and perspectives

講師：Alexander Tavrov 氏
(国立天文台、研究員)

日時：平成 20 年 3 月 14 日(金) 14:00 ~ 15:00

場所：北海道大学工学部物理工学系会議室 I (A3-62)

主催：応用物理学会北海道支部

講演の要旨

To observe an extra solar planet a three-dimensional common-path interferometer is proposed, which can achromatically null out an on-axis source while maintaining the detectability of an off-axis source. A geometric phase in the three-dimensional interferometer introduces an achromatic π -phase shift to the light from the star source, such that destructive interference nulls out the star light at one of the ports of the interferometer. Light from the planet, which is exempt from destructive interference, comes out from both ports with equal intensity.

The common-path scheme makes the system highly immune to environmental disturbances.

In our experiment, a 10^{-6} peak-to-peak nulling contrast was obtained at $1.8729\lambda/D$ distance.

To attain a deeper nulling for an extended incoherent star disc, a new scheme for an achromatic interfero-coronagraph AIC, incorporating two common-path interferometers in tandem, is proposed. A star coronagraph, based on the proposed technique, has the possibility to reach a 10^{-10} nulling contrast for an almost $10^{-2} \lambda/D$ effective source size. A proof for achromaticity and several perspectives to enhance general AIC nulling performances will be discussed.

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