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Direct Detection of Exoplanets and Circumstellar Disks

**A 400-3500 nm spectroscopy through a common-path interfero coronagraph instrument on 600 mm telescope on RS ISS**

## Authors

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## Abstract

A  $10^6 \dots 10^{10}$  high-contrast coronagraphy is required to image and to characterize extra-solar planetary systems among other faint astronomical targets observed in the vicinity of bright objects. Stellar coronagraphy becomes a rapidly evolving field with many enhanced alternatives to the classical Lyot coronagraph. In this list, an interfero-coronagraph (AIC) is advanced because its wide achromaticity and because its leading spatial resolution specified as the IWA. We developed a common-path achromatic interfero-coronagraph CP-AIC to maintain an OPD trend in an AIC method. At next we proposed the tandem TCP-AIC to obtain a  $10^6$  coronagraphic contrast at  $0.8 \cdot \lambda/D$  IWA by the ratio of planet to star separation to the stellar size at  $0.01 \cdot \lambda/D$  as considering the Earth-Sun pair. Perspective survey for exoplanets and for faint contrast astronomical objects combines coronagraphy and spectroscopy to enable a material- and potential bio-markers recognition. Solar System planetology has a wide use of observing spectroscopy from surface geology to atmosphere climatology. A 600 mm space telescope is scheduled to monitor the planets spectral identities on the board of Russian Segment of ISS. Among the telescope instruments is a stellar coronagraph (CP-AIC) with a CCD camera observing in a visible wavelength range. CP-AIC is co-linked with a low resolution spectrometer covering 1000...3500 nm to identify the spectral characteristics of faint objects. Special efforts correct a 600 mm telescope pointing error.

