

**V69a Common-path achromatic interferometer-coronagraph: breadboard demonstrator images**

Alexander Tavrov、田村元秀、西川 淳 (国立天文台)、武田 光夫 (電気通信大学)、黒川 隆志 (東京農工大)

Three-dimensional common-path interferometer is proposed to obtain achromatic nulling of the on-axial source; the off-axial source remains detectable. 3D interferometer causes the achromatic 180 deg phase shift, so that the on-axial source interferes destructively. For the off-axial source, the light is split by the ratio at nearly 50 / 50 between the Bright and the Nulled ports. The common-path scheme compensates effectively the optical path and is immune to environmental instabilities and allows to have an exposure time over several hours. The present common-path achromatic interfero-coronagraph nulls effectively either the linear polarization with 45 deg. azimuth or circular polarizations. For these polarizations, the chromatic properties of the beamsplitter and metal mirrors chromatic phase are balanced in two interferometer arms. In breadboard demonstrator images, the pixel intensities have been summed up and by that means we have measured the ratio of nulling contrast  $1e-3$  for 300 nm broadband light in visible. For laser light we reached the nulling contrast below  $1e-5$  at 633 nm wavelength, by use of spatial filtration and without its use we reached  $2e-4$ . We outlined the main limiting factor is the mirror surface figures, the technique of differential aberration is now under consideration.