

**W32b      Development of laboratory experiment of Prolate Apodized Lyot Coronagraph (PALC)**

Venet, Melanie(ニース大学)、 塩谷圭吾、中川貴雄、片ざ宏一、田中深一郎 (ISAS/JAXA)、  
Abe, Lyu(国立天文台)

We realized the first laboratory experiment of Lyot Coronagraph with prolate apodized entrance pupil (PALC) (Aime et al. 2001), in order to validate the concept of a multi stage PALC (MS-PALC). This work was done in the context of the Japanese 3.5 m SPICA space telescope which is expected to offer high contrast imaging capabilities in the mid infrared (mIR). The PALC uses a system of occulting mask and diaphragm to remove the major part of the star light, combined with a prolate apodization which is the theoretical optimal solution to reduce the stellar diffraction rings that cannot be removed by the focal mask. The first step of this experiment was to check that the apodizers manufactured using the High Energy Beam Sensitive-glass (HEBS) technology, could actually achieve the expected performance. Therefore, we chose to check the achieved contrast in the single stage PALC configuration before envisaging a multi-stage setup. We describe the optical arrangement, setup procedures, and obtained laboratory results. We show that the latter suffers from discrepancy with the expected performance, which originates from a phase aberration induced by the HEBS-glass (not precisely known at the time of the experiment). Nevertheless, we discuss some possible ways to overcome this problem and demonstrate the multi-stage approach.