N33b Asymmetrical surface brightness distribution of Altair observed with the Navy Prototype Optical Interferometer

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We report the non-uniform surface brightness distribution of Altair measured with the Navy Prototype Optical Interferometer, NPOI. Recently, Palomar Testbed Interferometer measured Altair's oblateness (van Belle 2001) caused by its rapid rotation. In order to confirm this result independently, Altair was observed with NPOI in 2001 and 2002. Calibrated visibilities showed that the oblateness and orientation angle of ellipsoidal fit was almost consistent with the results of PTI.

In addition to the visibilities, closure phases are measured with NPOI. Closure phase is a quantity, which is sensitive to the asymmetry of the brightness distribution of the light source. Measured closure phases of Altair showed non-zero/180 values. This means that the Altair was not only flattened but also asymmetrically brightened.

Though asymmetrical brightness distribution of stars such as Mira and supergiants are already reported, this is the first time for main sequence stars. We consider it is due to the gravity darkening and inclination of the rotation axis. Simple Roche model is calculated with parameters such as inclination, orientation angle and degree of sphericity. We are trying to fit the parameters with data.

In this talk, we will report the confirmed oblateness and the fitted parameters of Altair.