V105b ALMA 偏波観測機能の科学評価活動報告 (4)

中西康一郎, 永井洋 (国立天文台), Ed Fomalont, Stuartt Coder (JAO), Richard Hills (Cambridge), George Moellenbrock (NRAO), Edwige Chapillon, Ya-Wen Tang (ASIAA)

Polarization observation is an unique and powerful tool to investigate astronomical objects and processes which are intimately connected to magnetic field. The Atacama Large Millimeter/Submillimeter Array (ALMA) can receive two orthogonal linear polarization simultaneously, and, by using four cross correlations between them, we can obtain four Stokes parameters and measure polarization of emission from the source. ALMA polarization observation will be capable investigating such as active galactic nuclei, pre-stellar cores, protoplanetary disks, etc., with unprecedented high spatial resolution and high sensitivity at mm/sub-mm wavebands. Polarization commissioning activities have been intensively carried out for the past three years to characterize and verify the ALMA polarization capability from system engineering and scientific point of view.

Our poster presentation will summarize recent progress in commissioning and science verification. We are now working not only on instrumental polarization verification but also on polarization calibration strategy. Calibration strategy will set limits to scientific observation structures and procedures. We performed polarization observations targeted to an object with known polarization properties, and found that ALMA has successfully gave consistent linearly polarized flux and a position angle of linear polarization which were reported by previous studies. The results clearly show that ALMA polarization capability and our calibration strategy are promising as a brand new tool for astronomy although further improvements will be needed.