[PID-09] Comparison of Strip and Ellipse Integration Methods for the Study of Radial Properties in Spiral Galaxies

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Dealing with images of galaxies, we need some techniques to convert the 2D images into radial profiles. GIPSY (Groningen Image Processing SYstem) provides 2 methods of strip integration (task *RADIAL*) and ellipse integration (task *ELLINT*) which calculate the radial profile of galaxy. They have different algorithms and concepts from each other, and the availability and applicability is also different.
To use them more specifically and correctly according to the data characteristics, I made various model galaxies which have different radii, inclinations, and peculiar shapes. And, I compared the radial profiles obtained from *RADIAL* and *ELLINT* methods. In conclusion, both of *RADIAL* and *ELLINT* give proper radial property if a galaxy has large radius, small inclination, and normal shape. However, for a galaxy of small radius and large inclination, *ELLINT*, and for a galaxy of peculiar shapes, *RADIAL*, are more suitable and recommended.

[PID-10] Simulation of Phase Delay Correction with Water Vapor Radiometer for KVN

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The phase delay at millimeter wavelength occurs mainly due to Earth atmosphere. It should be corrected in order to obtain high signal-to-noise ratio in the millimeter VLBI observation, e. g. Korean VLBI Network (KVN).
To simulate the atmospheric phase delay, we took an atmospheric model with three components - molecular oxygen of dry air, water vapor, and clouds. Among them water vapor is the most important source of the millimeter wave phase delay, since water vapor distributes randomly in the atmosphere and it has non-dispersive nature. One of the promising phase correction techniques is so called water vapor radiometer (WVR) method. Also, simultaneous multi-frequency observation system in KVN play a important role to practice this method. With the atmospheric model mentioned above, which is based on Microwave Propagation Model (Liebe 1987), we are carrying out the phase delay simulations. The purpose of the simulation is to define the specification of the supposed KVN WVR system. The evaluation of the simulation results and the discussion about the realization of the KVN WVR system will be reported in the near future.