Report on a Class Visit to the VLA

Haverford College

Haverford College's undergraduate class on Non-Optical Astronomy requested and received 5 hours of observing time on the VLA through NRAO's observing program for university classes. The course, taught by Bruce Partridge, focuses primarily on radio astronomy, so the opportunity to plan a run on the VLA, visit the site and analyze the data afterwards was a valuable addition to the usual course work. The class, made up of Haverford students Sonia Aggarwal, Justin Cantley, Brook Henkel, Lee Herron, Vann Joines, Sebastian Mankowski, and Ryan Sajac, and Bryn Mawr student Kayla Gaydosh, divided into three working groups to plan and carry out the observing project. Ryan Sajac took the lead in creating the JOobserve file for the run, and other students worked on the flagging, calibration and imaging of the data. Note that all members of the class were involved in this activity, and all made the trip to Socorro.

We spent 3 1/2 days in Socorro and at the VLA site. While we were at the AOC, we heard a lecture on plans for the EVLA given by Rick Perley, and at the site, Jon Thunborg provided an opportunity to walk on a bird-bathed dish, and to view the antenna feed horns. The class also had an opportunity to enjoy local hotspots like El Sombrero and the Eagle Guest Ranch.

The observing run was conducted in two pieces, one in quite poor weather. The VLA was in its A configuration. The students considered several possible observing plans, and selected a combination of two. First, the group made multi-frequency observations of three, bright, inverted spectrum or GPS sources that had been mapped using the VLBA earlier in the fall by Jon Marr and Bruce Partridge. The aim was to provide observations at frequencies overlapping the VLBA images, and at resolution scales 1-2 orders of magnitude larger. Second, similar multi-frequency observations (1.4-22 GHz) were made of a number of other radio sources having flat or rising microwave spectra. Some of these were bright blazars being monitored at higher frequencies by the group at Helsinki Observatory (Lahteenmäki, private communication), and others were drawn from a set of GPS sources studied by Tinti and her colleagues, and still others were drawn from a list of extreme GPS objects discovered in earlier VLA work by Guerra, Cabanela, Myers and Partridge. In the case of the last two categories, VLA observations had been carried out earlier in the C configuration, so our higher resolution data provides information about the central concentration and morphology of these sources.

To date, we have carefully flagged, calibrated and imaged the L, C and X band data. We quickly discovered that one of our sources was resolved at the two higher frequencies. Since this was supposed to be a GPS source, this produced some excitement; we later discovered that it was a relatively well known lensed source. Next, we made tapered images at the higher frequencies to see if the (tapered) flux densities matched those seen at the same frequencies but with lower resolution the same resolution in earlier C- configuration observations.

The K-band observations will take some rescuing, particularly those made on Oct. 22, when it was raining and windy.

Results on the 3 VLBA sources are tabulated below, as a sample of our findings.

	Flux and IMFIT error; Jy	
Source	**L-band**	**X-band**
1310 + 326	0.65 ± .04	0.83 ± .05
1459 + 336	0.035 ± .008*	0.420 ± .02*
1602 + 268	--	0.265 ± .02**

*resolved **barely resolved

References

Partridge, R. B., Guerra, E. J., Cabanela, J. E. and Myers, S. 2003, *Bull. AAS*, **35**, 724.

Tinti, S., Dallacasa, D., DeZotti, G., Celotti, A. and Stanghellini,, C. 2004, *A & A*, in press.