

NATIONAL RADIO ASTRONOMY OBSERVATORY
Edgemont Road, Charlottesville, VA

21 July 1986

TO: Paul Vanden Bout

FROM: Alan Bridle

RE: (u,v) coverage for VLBA with Nobeyama added

Here, as you requested, is a brief assessment of the benefits to VLBA imaging of working with Nobeyama. Attached are two plots showing:

1. The (u,v) coverage for the current "maximum likelihood" VLBA.
2. The (u,v) coverage of (1.) with Nobeyama added.

The main improvement in the coverage is an increased density of tracks in the outer (u,v) plane, with a modest increase in resolution (particularly in the East-West direction) for sources north of about 10 degrees Declination. The improvement in track density would be particularly valuable for sources at declinations between 15 degrees and 30 degrees, where the longest East-West baseline of the stand-alone VLBA is significantly "detached" from the rest of the coverage. For more southerly sources, the benefits are minor, because the tracks that involve Nobeyama become shorter and also tend to fall at the edges of gaps in our coverage rather than in the areas of greatest concern.

A further benefit of working with Nobeyama would be the improved signal to noise on long baselines where source visibilities are falling. This would improve calibration and image quality for weaker, resolving sources, and might therefore be particularly important for observations at the highest frequencies.

I conclude that adding Nobeyama to the array would significantly enhance its ability to image fine structure, particularly in the East-West direction, for sources that are North of the equator.