FIRST RESULTS OF THE VLBI-INVESTIGATION OF SOURCES FROM GEODETIC IRIS-EXPERIMENTS

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The geodetic *IRIS*-network is a transatlantic 5-station VLBI-array dedicated to monitor variations of the earth's rotation (e.g. Carter et al.,1985). In a 5 day cycle 14 extragalactic radio sources are observed in regular intervals, covering a GST-range of up to 24 hours, using the MkIII-system in Mode C at 3.6cm (X-band) and 13cm (S-band) wavelength. As this database provides a great potential to monitor source structures and their changes with mas-resolution (the sample contains at least 7 "superluminals"), we have initiated a project to obtain radio maps at both frequencies and to determine, how accurate physical parameters like component flux densities and separations can be measured. Early results are published in Schalinski (1985) and Schalinski et al. (1986).
In addition to astrophysical applications, we investigate the influence of structure phases on phase- and group-delay corrections (s. Campbell et al.,this vol.).
Since the amplitude calibration of geodetic VLBI-data at present is a major problem due to insufficient radiometry, and self-calibration techniques are of only limited use for snap-shot data, the instalment of a consistent calibration is of great importance. We selected the BL-Lac objects 0212+73 and 1803+78, for the following reasons:

1. Due to the fact that these sources are circumpolar and are thus observable during the whole session, these two objects are the best observed sources among the sample with the most regular *uv*-coverage.
2. The mas structures of these sources are well-known from VLBI-experiments at different frequencies and epochs (e.g. Eckart et al.,1986), so that the calibration of the *IRIS*-data can be checked independently (partly the data were taken at the same epoch).
3. The source morphology (core-jet type) is such that these sources can be mapped adequately with four station networks; components or structural variations can be easier identified at different epochs than in maps of sources with complex structure. In the following we summarize the main results: {1} We obtained a consistent calibration for both sources at S- and X-band by incorporating models at 1.6 and 5 GHz (details s. Schalinski, 1985). 1803+78 serves as a "calibrator", because it's structure basically consists of "stationary" components, separated by about 1.4 mas (X-band) and 5 mas (S-band) under a position angle of almost 260 (s.Fig.1). {2} We made *hybrid*-maps with the *HYBER*-software

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package of the MPIfR for these sources at the following epochs: 1983.4, 1983.9,1984.3,1984.5,1984.6,1985.8,1986.2,1986.5 and 1986.9. Up to 7 iterations were sufficient for convergence. The dynamic range in the VLBI-maps reaches 50:1. Furthermore, we demonstrated the applicability of the calibration scheme by mapping the quasar 4C39.25 at 2 epochs (s.Fig.2: Schalinski,Alberdi et al.,this vol.). The procedures used to calibrate and map the sources allow to reduce more data in a reasonable amount of time and thus enable us to extend the mapping to the other *IRIS*-sources. This work is in progress. (3) From modelfitting of the 1803+78- and 0212+73-data we determined the errors on component flux densities and separations to be on the order of 20%. Preliminary analysis of spectral indices for 0212+73 showed that the *core* has an inverted spectrum with a median of α[2.2/8.4GHz]=0.3 +/- 0.1, in good agreement with the value obtained for a statistically complete sample of flat spectrum radio sources (0.4 +/- 0.2:Eckart et al.,1986).
Further improvements of the calibration and dynamic range of the maps require flux density monitoring during each *IRIS*-run - at least one measurement of the "calibrator" 1803+78.

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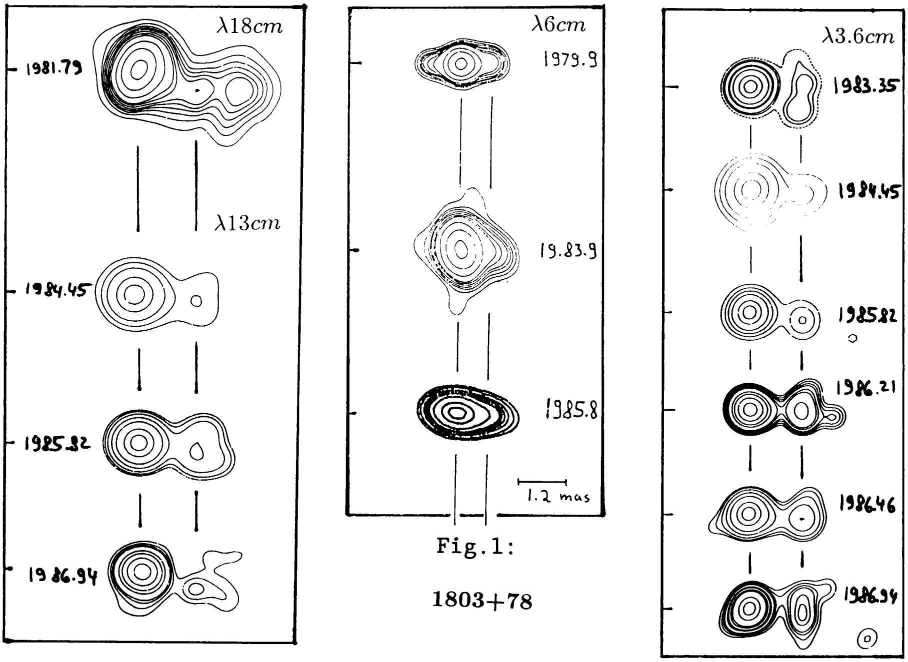

Fig.1:

1803+78

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