

POINTING ANALYSIS

----> pointing analysis was done using the xls file 'pointingNGC1333.xls'. This spreadsheet is based upon the M82 pointing analysis posted on the analysis logbook (Feb. 04, 2008). fitgauss was used to fit the centroid of 4B, but the 'mike' option had to be modified in order to account for the brighter source 4A in the field of view. Now version fitgauss 3.0+. fitgauss was called on the command line as:

```
./fitgauss ./NGC1333/44658_int.fits ix0 5 iy0 9 m e
```

where each file was opened and observed to find the ix0 and iy0 offsets. Note that version +3.0 is only on M. Attard's laptop.

SMOOTH TAU:

----> Used Darren's smooth tau results posted on analysis logbook.

CHI-SQUARED:

----> data broken up into bins consisting of 2 dithers a piece. Each bin is referred to as 4Bbin1, 4Bbin2, 4Bbin15 for a total of 14 bins (data comprising the 9th bin was found to be bad and so removed). All data is stored on sharp@zamin /mike.

New polsharp5 used with v5 output. Note that the Sept 08 RGM is used for data processing. Results illustrated below. Command line argument followed by screen output is:

```
./chi2 -f names.list -update
```

Summary of results for whole map:

Reduced Chi Squared mean and standard dev. for the I map: 5.561860, 8.562913
Reduced Chi Squared mean and standard dev. for the Q map: 1.770177, 0.839303
Reduced Chi Squared mean and standard dev. for the U map: 1.748499, 1.332152
The inflation factor averaged over the map: 1.210897

The above analysis was repeated for the case of 7 bins instead of 14, with 4 dithers per bin. Results are indicated below:

Summary of results for whole map:

Reduced Chi Squared mean and standard dev. for the I map: 8.765780, 14.515510
Reduced Chi Squared mean and standard dev. for the Q map: 1.798247, 1.410424
Reduced Chi Squared mean and standard dev. for the U map: 1.962794, 1.782930
The inflation factor averaged over the map: 1.176152

Comparing the two inflation factors indicates the two results are fairly comparable; the 14 bin case is now used for the following sections.

RESULTING POLARIMETRY AND INFERRED MAGNETIC FIELD:

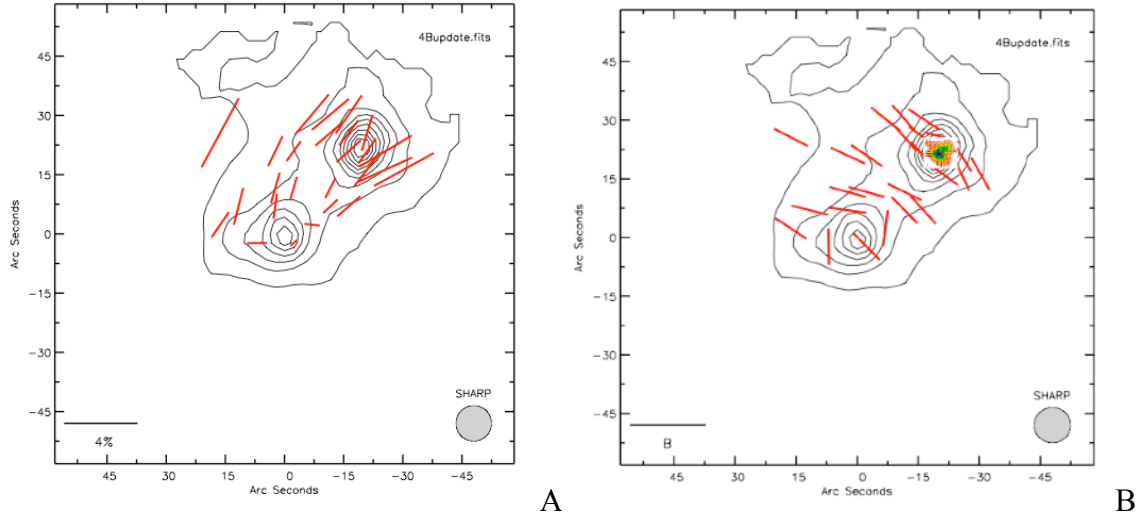


Figure 1: SHARP polarimetry (A) and deduced magnetic field (B) over 4A and 4B. Both images are centered on 4B (R.A 3h29m12.06s, DEC +31:13:10.8) with 4A lying towards the upper right-hand corner. The vertical and horizontal axis show offsets in right ascension and declination, respectively. Contour levels are 0.1, 0.2, ... 0.9 times the peak flux value (7.85 Jy/beam). Image B also shows the Girart et al. 2006 magnetic field map superimposed on 4A to illustrate the difference in spatial scale. Note that all the vectors presented in image A are $P > 3\sigma$.

TABULAR VALUES:

Table 1: Numerical Values for 4B and 4A (italics) Vectors. Note Phi angles describe the orientation of the deduced magnetic field.

rao (arcsec)	deco (arcsec)	P (%)	dP (%)	Phi (degrees)	dPhi (degrees)	P/dP
22.752	2.607	1.7	0.5	55.3	6.9	3.48
23.226	26.07	4.3	1.1	61.6	8.6	3.87
18.723	5.925	2.1	0.7	75.6	8.5	3.17
9.48	0	1.1	0.3	0.6	7.6	3.73
9.48	5.451	1.4	0.4	81.9	8.2	3.69
9.243	10.665	1.7	0.5	74.1	10.1	3.65
9.006	21.093	1.8	0.6	64.2	9	3.05
3.318	-1.422	0.5	0.1	43.6	9.1	3.44
4.503	10.902	1.3	0.3	73.9	8.8	4.03
3.792	21.804	1.3	0.4	54.2	9.1	3.62
-4.266	-4.74	0.8	0.3	173.2	9	3.27
-1.185	31.521	2.8	0.9	50	6.4	3.05
-6.162	8.295	1.1	0.3	43.3	8.2	3.49
-5.214	11.613	1.2	0.2	63.1	5.5	5.31
-6.399	27.255	2.2	0.6	40.5	7.9	3.44
-6.399	31.995	2.6	0.7	39.9	4.7	3.77
-11.139	8.295	1.7	0.5	41.2	7.4	3.28

-11.139	22.515	1.8	0.3	42	2.7	5.85
-10.428	26.544	1.7	0.3	52.6	5.6	5.16
-10.428	31.047	2.5	0.5	55.4	4.2	5.53
-15.168	17.064	2.3	0.6	52.4	5	3.78
-15.168	21.567	1.7	0.4	55.1	4.9	4.53
-14.457	25.122	2.1	0.5	73.1	5.6	4.38
-21.804	18.486	3.2	0.7	24.2	5.6	4.74
-21.33	22.989	3.3	1	30.8	6.2	3.2
-26.07	18.486	3.7	0.8	28.8	4.9	4.84