NGC 6334I(N) Analysis

Flags:

The following flags were used when running the data reduction pipeline (sharpinteg2, sharp_combine_v5, polsharp5):

./sharpinteg2 ./NGC6334/sharc2-0$i.fits -r ./NGC6334/rgm.may08.dat -f 1 -sil -c -em

./sharp_combine_v5 ngc6334p.list 6334p.fits -hwp 6 -l 51 51 -q -sm 2 -ma 5 -ps 4.75 -pm 6.3 -bg 10 0 -ip 0.0 0.0 -0.0015 0.0003

polsharp5,'6334p.fits',/vec,skipv=4,maxsig=3,color=2,eff=0.93,onep=1

NOTE:

1. The -ip for sharp_combine was obtained from the logbook and are the 450 micron values from the June 2007 run.
2. The RGM used is the more rigorous of the two produced for this run (51% non-bad pixels).
3. Pointing corrections and smooth tau already treated for.

Chi-Squared Analysis:

I ran this data set through the chi2.c program with 3 different bin divisions in order to check for any dependence of the χ^2 value on the # of bins. The 3 cases included dividing the data set into 10 bins, 6 bins, and 3 bins. The results are summarized below:

Data broken up into ***10 bins*** {1st 6 bins have 2 files each, last 4 have 3 files each}. Each bin is denoted as 6334bn.fits, where n=1...10. The chi2.c list file is 6334chi2_10.list. All files are stored in the "mike" directory on zamin. Cumulative image is 6334p.fits.

>./chi2 -f 6334chi2_10.list

Summary of results for whole map:
Reduced Chi Squared mean and standard dev. for the I map: 22.706621, 18.259016
Reduced Chi Squared mean and standard dev. for the Q map: 1.561678, 0.840329
Reduced Chi Squared mean and standard dev. for the U map: 2.382779, 1.232625
The inflation factor averaged over the map: 1.405404

Data broken up into ***6 bins*** {4 files each}. Each bin is denoted as 6334bn_6.fits, where n=1...6. The chi2.c list file is 6334chi2_6.list. All files are stored in the "mike" directory on zamin. Cumulative image is 6334p.fits.

>./chi2 -f 6334chi2_6.list

Summary of results for whole map:
Reduced Chi Squared mean and standard dev. for the I map: 11.808168, 12.747828
Reduced Chi Squared mean and standard dev. for the Q map: 1.667792, 1.170865
Reduced Chi Squared mean and standard dev. for the U map: 2.056946, 1.497900
The inflation factor averaged over the map: 1.269892

Data broken up into ***3 bins*** {8 files each}. Each bin is denoted as 6334bn_3.fits, where n=1...3. The chi2.c list file is 6334chi2_3.list. All files are stored in the "mike" directory on zamin. Cumulative image is 6334p.fits.

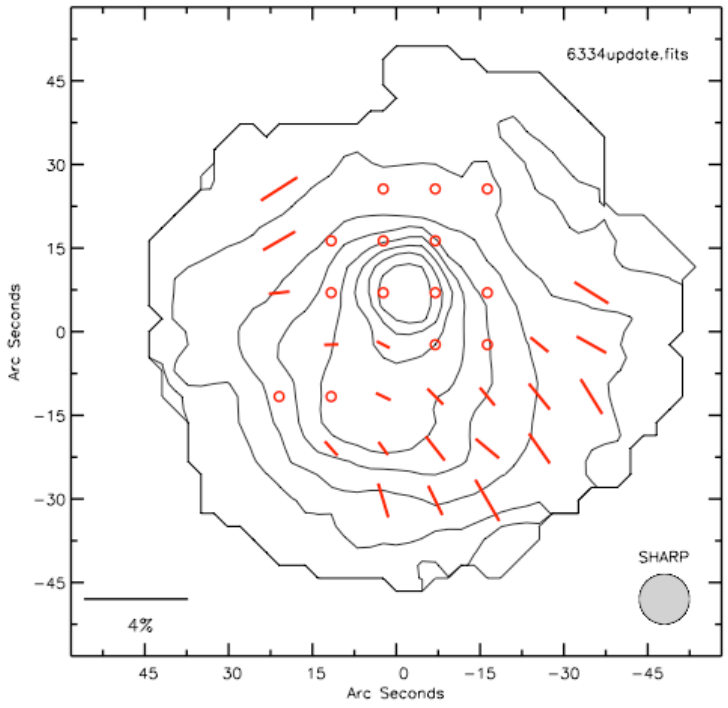
>./chi2 -f 6334chi2_3.list

Summary of results for whole map:
Reduced Chi Squared mean and standard dev. for the I map: 20.937217, 27.860093
Reduced Chi Squared mean and standard dev. for the Q map: 1.941581, 2.082256
Reduced Chi Squared mean and standard dev. for the U map: 2.210758, 2.364226
The inflation factor averaged over the map: 1.548557

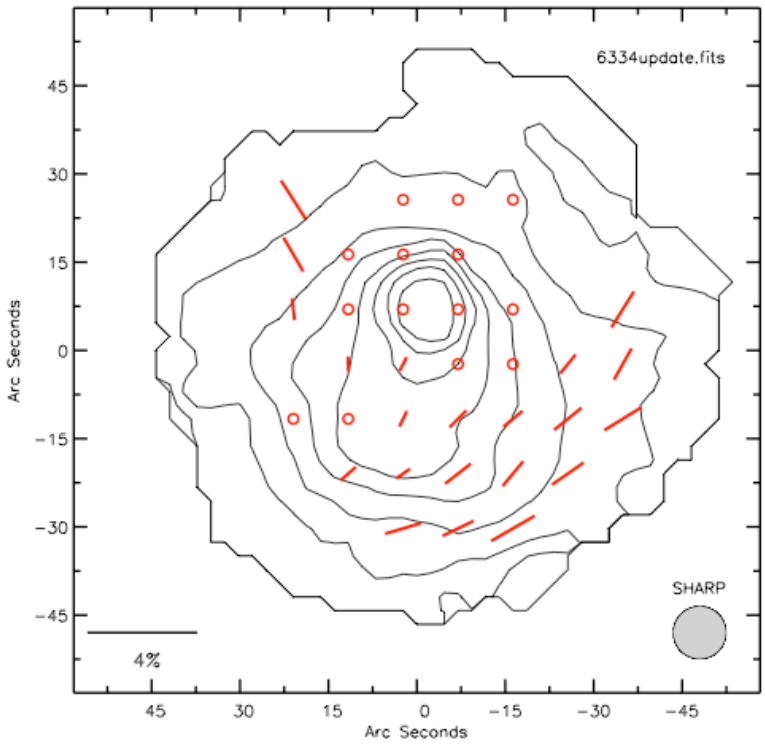
One can see from the results here that there is little variation in the mean χ^2 values for the Q and U Stokes parameters due to bin size. Therefore, I inflated my errors on a pixel-by-pixel basis using the reduced chi-squared map generated in the 6 bin case.

Maps: (Note circles indicate regions where p + 2dp < 1%)

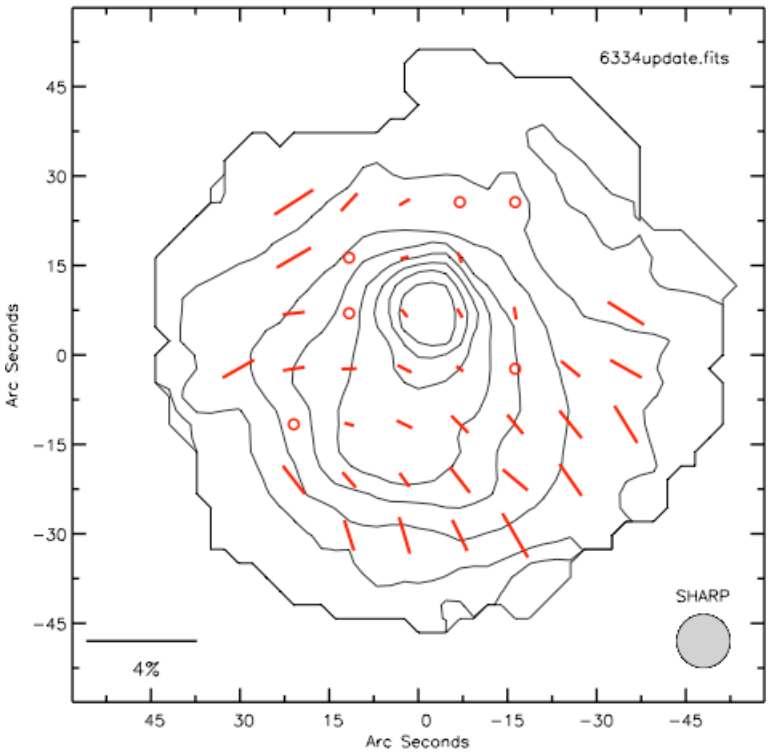
The 3-sigma polarimetry map:



The 3-sigma inferred B field map:



The 2-sigma polarimetry map:



The 2-sigma inferred B field map: