This document is meant to address concerns that the standard deviation in the reduced χ^2 result are too large for the case of NGC 6334 I(N). I am following the instructions give by GN on how to deal with this, namely:

Here are the details of my idea on how to check that the statistical variations in the red-chi-2 are not messing up the results. Basically, the idea is to analyze the data "the old way" to (hopefully) show that when you smooth over those fluctuations it doesn't make much difference to the final results:

1. Compute the red-chi-2 for Q and U averaged over the whole map. It doesn't matter how many bins you use for this, since you have shown its not a major factor. Probably should use 6 bins, the intermediate value. Call the results red-chi-2-Q and red-chi-2-U. Take an average of these two numbers and call it red-chi-2-Stokes.
2. Analyze the data WITHOUT inflating the errors at all. Then, to get a 3-sigma-threshold map, set the nominal threshold to 3 times root(red-chi-2-Stokes). To get a 2-sigma-threshold map, set the nominal threshold to 2 times root(red-chi-2-Stokes). Hopefully these will look like what you already produced.

This is the procedure I followed. I used the 6 bin case to obtain red-chi-2-Stokes. The stats from the 6 bin case are:

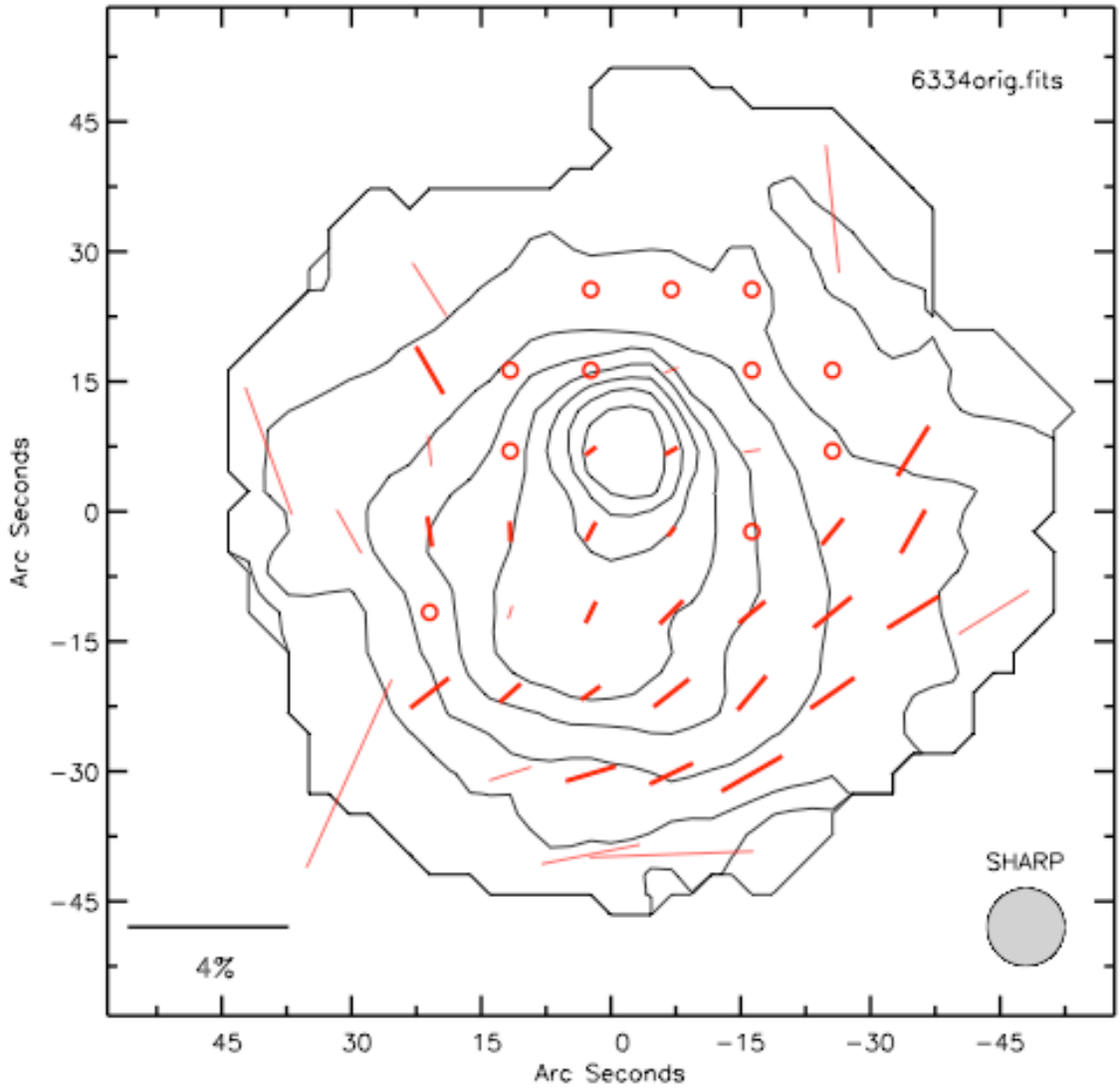
Summary of results for whole map:
Reduced Chi Squared mean and standard dev. for the I map: 11.808168, 12.747828
Reduced Chi Squared mean and standard dev. for the Q map: 1.667792, 1.170865
Reduced Chi Squared mean and standard dev. for the U map: 2.056946, 1.497900
The inflation factor averaged over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

These results are also indicated in the Feb 19 2009 memo. Therefore, the value of red-chi-2-Stokes is 1.865.

The polsharp5 commands I used plus the resulting maps are:

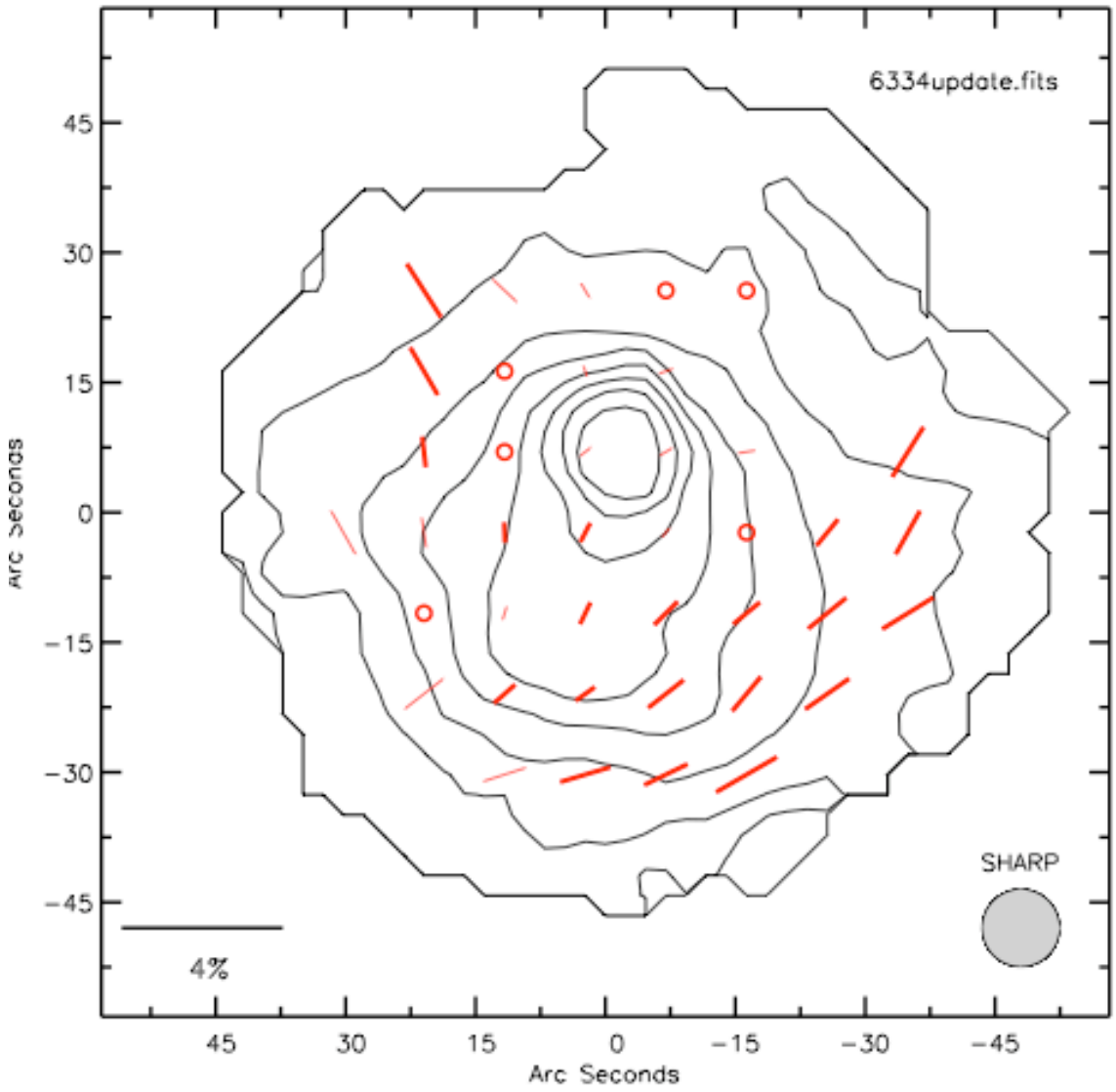
No Error Inflation:

polsharp5,'6334orig.fits',/vec,skipv=4,maxsig=4.10,sig2=2.73,color=2,eff=0.98,onep=1,/rot,/ps



Error Inflation With chi2.c:

polsharp5,'6334update.fits',/vec,skipv=4,maxsig=3,sig2=2,color=2,eff=0.98,onep=1,/rot,/ps



A comparison of the two maps shows they are in general agreement. The presence of erroneous vectors towards the edge of the first map is to be expected. The application of the chi2.c program tends to weed out these vectors as they are not "seen" in all the bins fed into the program.