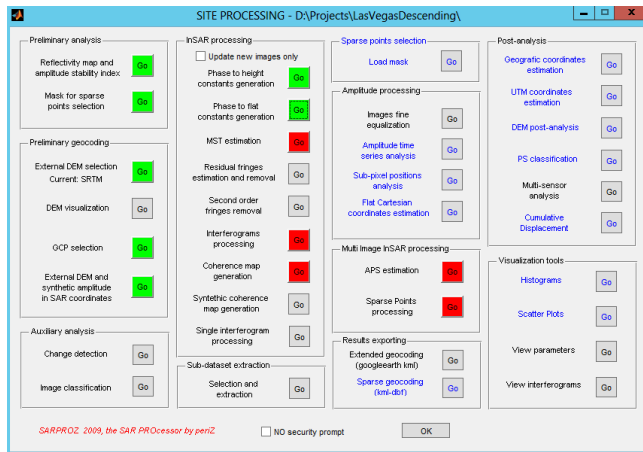
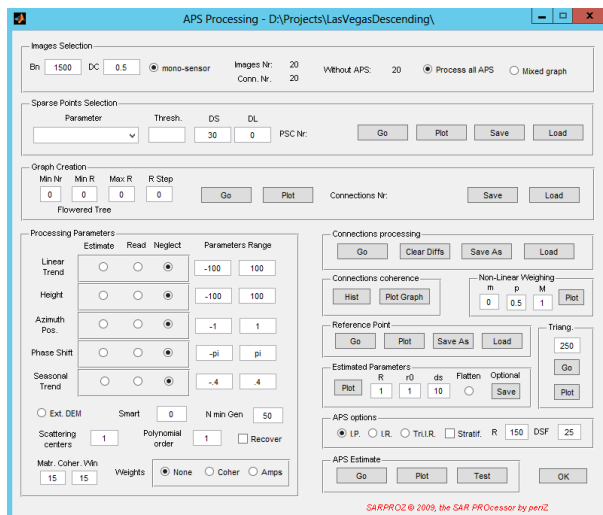


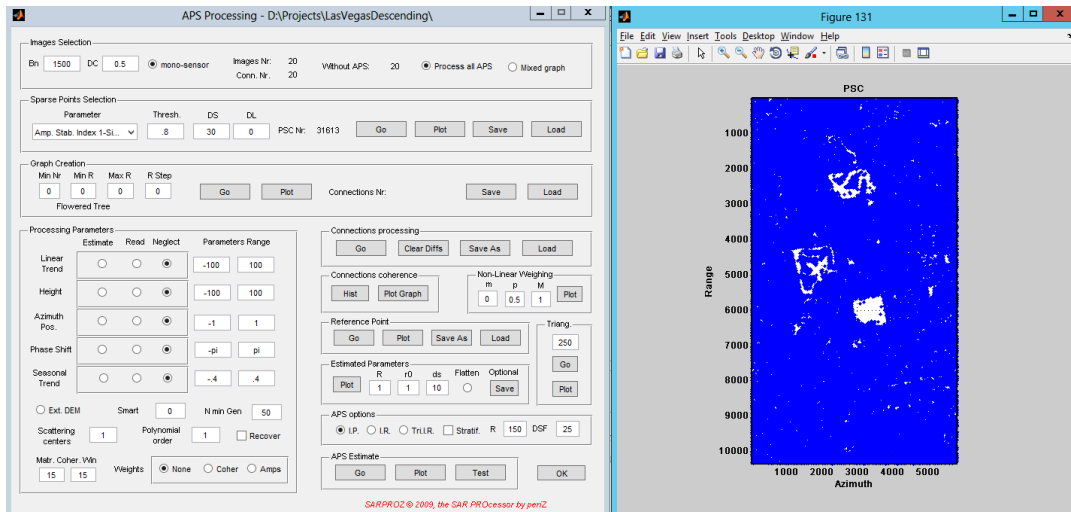
APS Processing



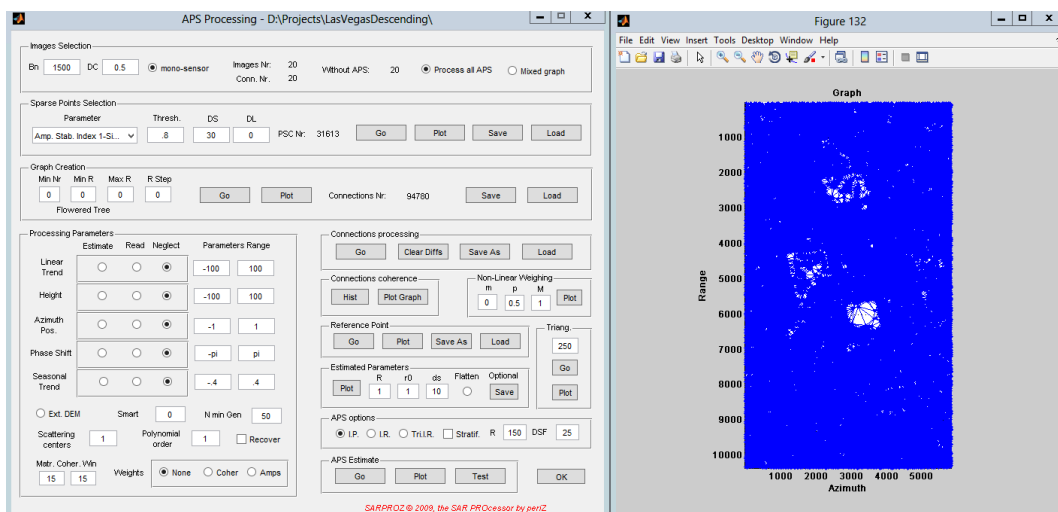
To start the APS processing, press the **Go** button next to the **APS estimation** label in the **Multi-Image InSAR processing** group.



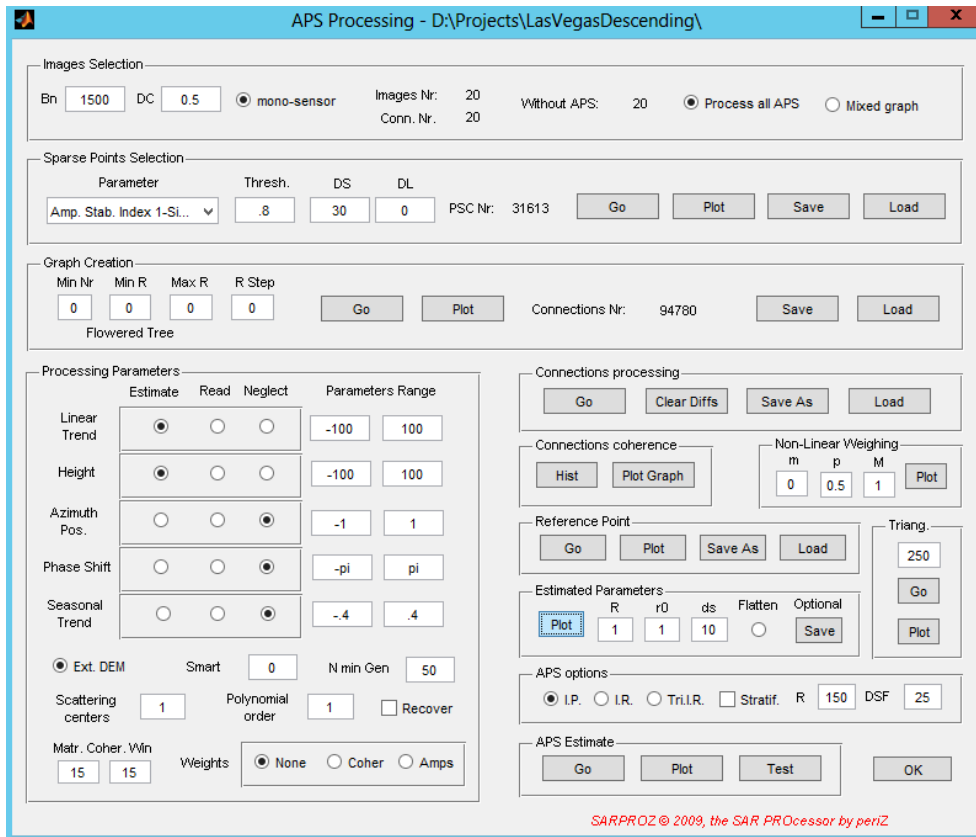
The **APS Processing** window opens. There are quite a lot of options to choose from. We are going to address the standard parameters step-by-step. In the beginning, we need to select the sparse points used for the processing. For this, we have to select a parameter used for the sparse point selection. There are quite a lot of parameters available. A good standard choice is the Amplitude Stability Index 1 – Sigma/Mu. Therefore, we are selecting **Amp. Stab. Index 1 – Sigma/Mu** in the **Parameters** box of the **Sparse Points Selection** group. As threshold, we enter 0.8 in the **Thresh.** text box. Then we press **Go** in the **Sparse Points Selection** group. Afterwards you can plot the selected points via the **Plot** button in the **Sparse Points Selection** group.



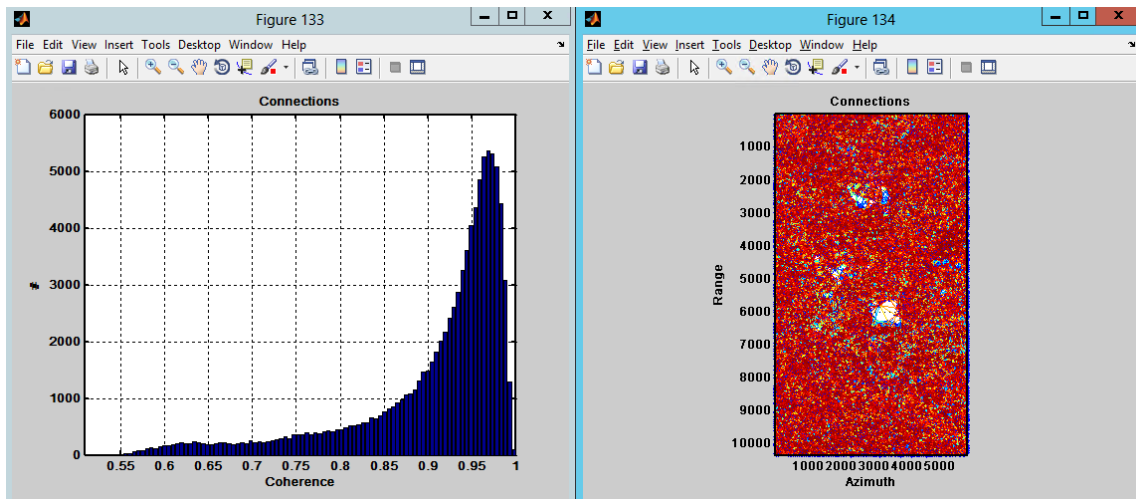
Now, we connect the graph using the **Go** button in the **Graph Creation** group. With the standard parameters a Delauny triangulation is used, which should be good in most cases. Afterwards you can plot the selected points via the **Plot** button in the **Graph Creation** group.



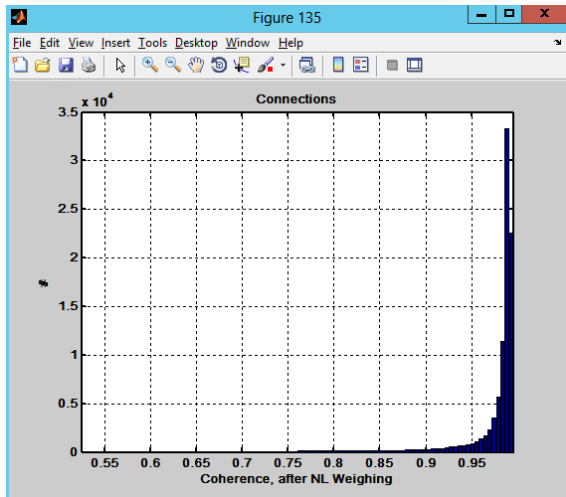
First, we chose some standard parameters for the processing. We estimate the linear trend between -100 to 100 mm/year and the height between -100 to +100m around the SRTM height. We therefore use the Ext. DEM for the height estimation.



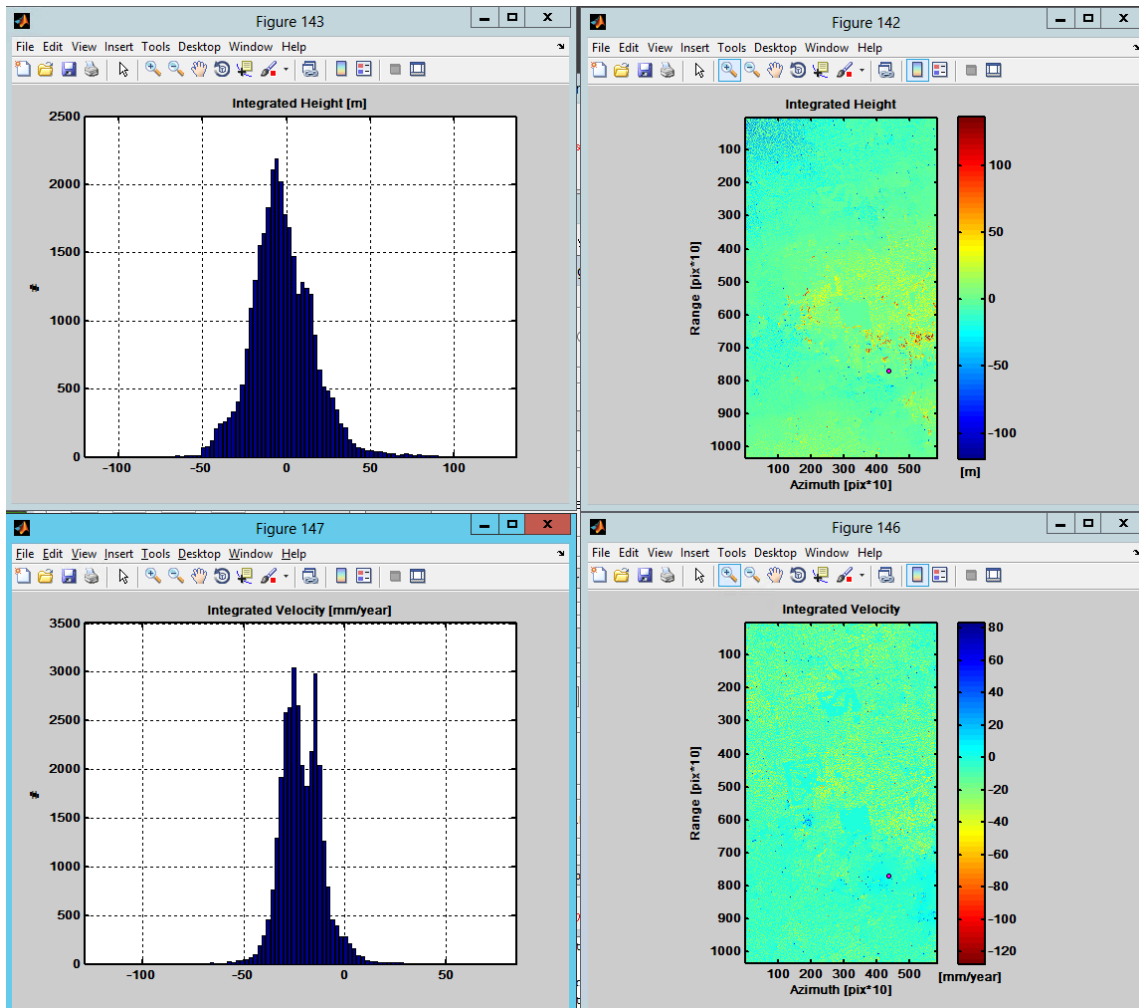
Afterwards, we press **Go** in the **Connections processing** group. This may take a while. After finishing, we check the **Histogram** and the **connections Graph** in the **Connections coherence** group by pressing **Hist** and **Plot Graph**.



They look good. We keep the standard parameters for the **Non-Linear Weighing** and press **Plot** in the **Non-Linear Weighing** group.

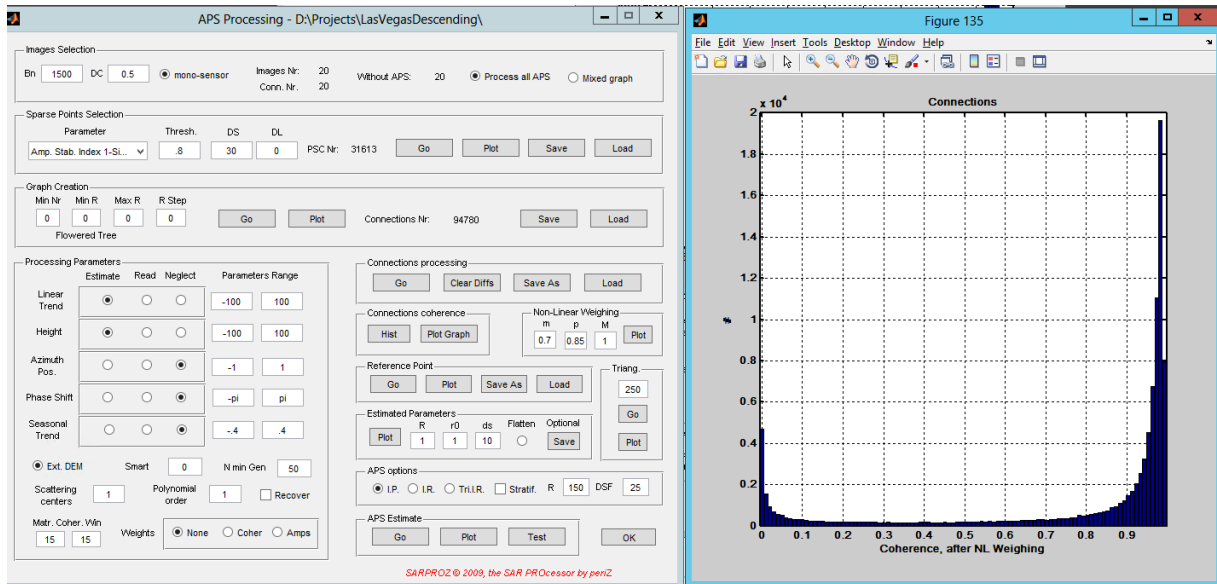


Looks OK, so we can continue. We calculate the reference point by pressing **Go** in the **Reference Point** group. Then we estimate the parameters by pressing **Plot** in the **Estimated Parameters** group.

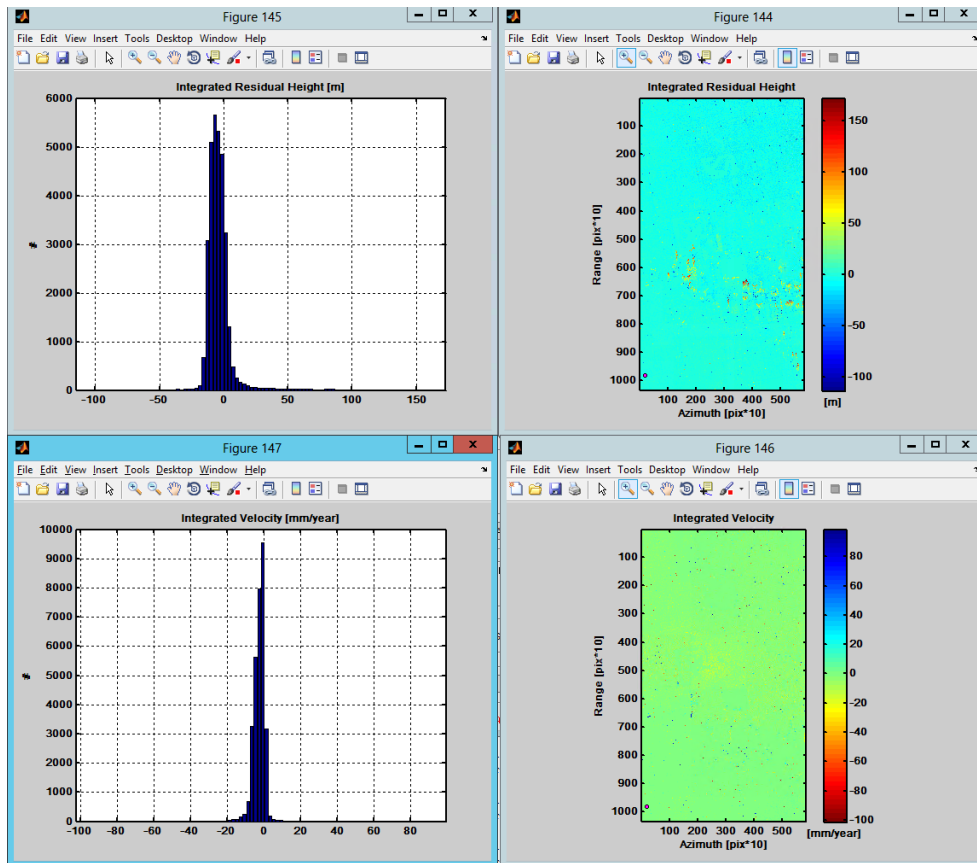


No the difficult part starts. We have to analyze the results and decide if they are OK and we continue, or if we have to adjust some parameters. This is a matter of experience and also requires a willingness to play with the parameters to see their effect. Well, in the results above, the heights look OK, at least we can see some of the high buildings are estimated correctly. However, the velocity is quite noisy and we are not satisfied.

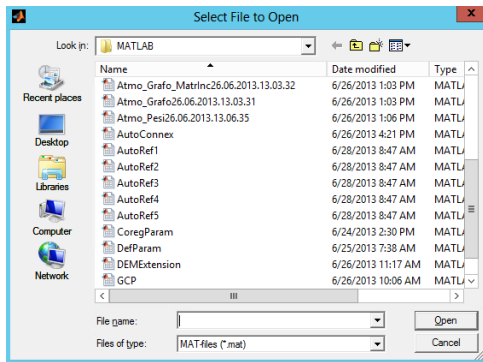
One parameter to adjust easily, without needing a long reprocessing, is the non-linear weighing. We are getting a bit more aggressive and going for 0.7, 0.85, 1



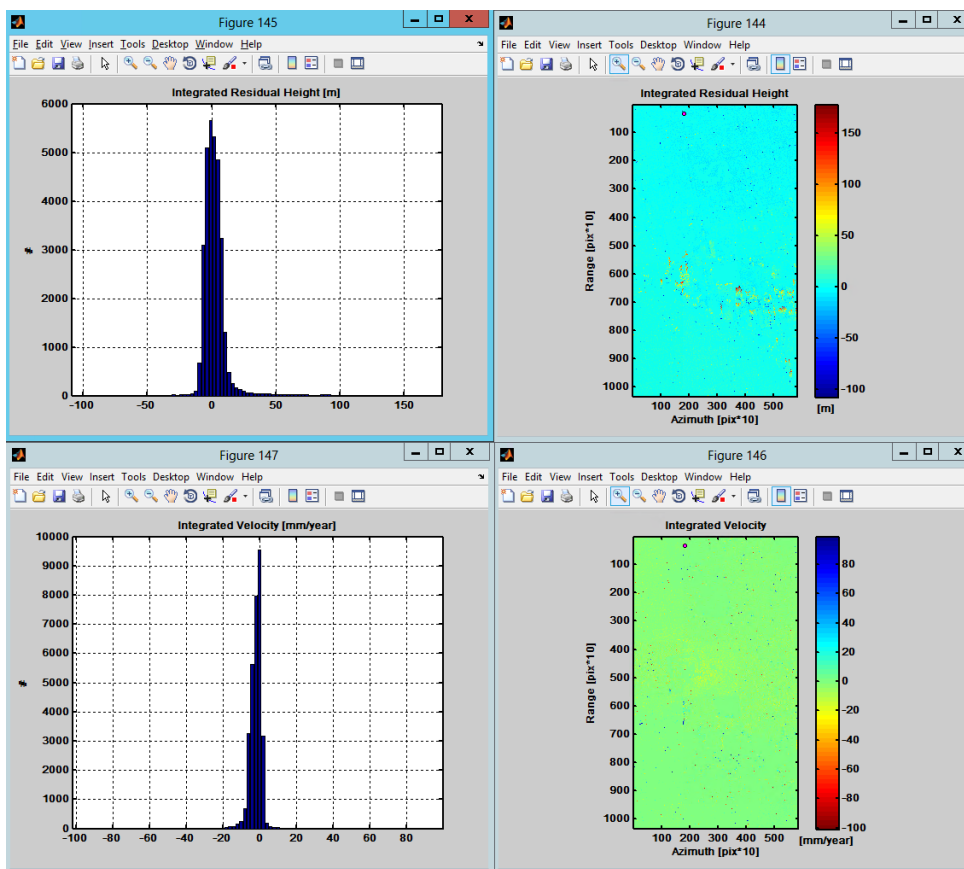
Again we recalculate the reference point and plot the estimated parameters.



Well, this looks already much better. The histogram of the integrated residual heights is shifted to the left, which might be because the selected reference point is on a building and not on the ground. We can select another reference point by pressing **Load** in the **Reference Point** group.

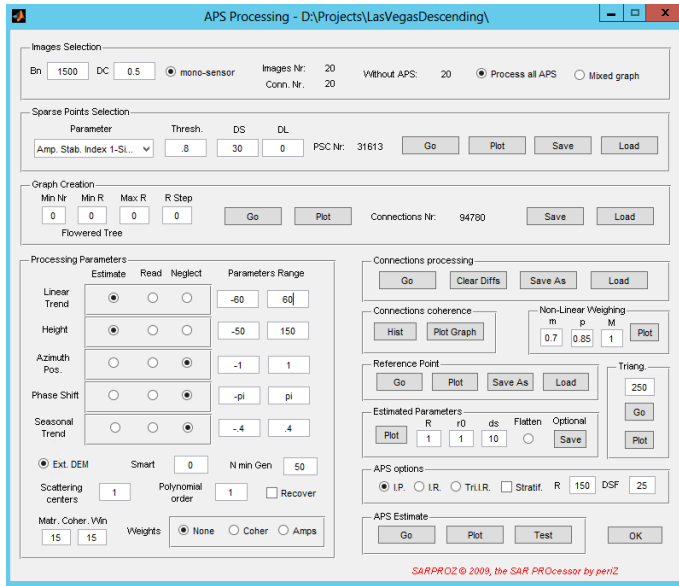


SARProZ is automatically creating five points called AutoRef1 to AutoRef5. We select AutoRef3 and plot the estimated parameters.

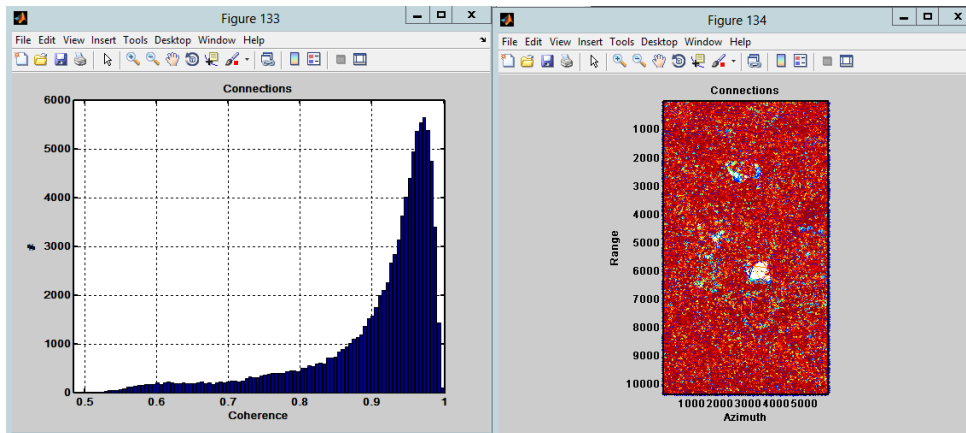


The height shift has gone. The results look OK and we could continue processing. However, we see that in our height estimation, the value of -100 to +100 might not be an optimal choice, because there are quite high buildings in the Las Vegas scene.

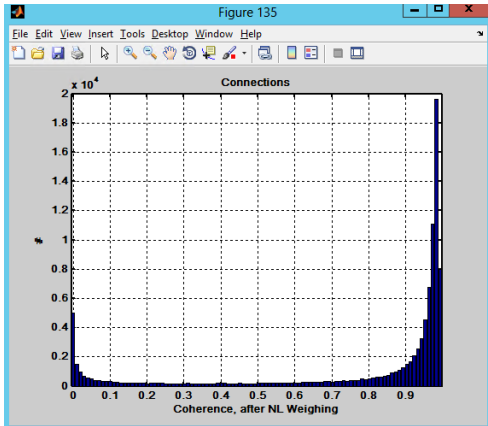
We are therefore changing our processing parameters. We are trying to estimate the height from -50 to 150m. We also saw in our first results that the velocity might be not so high. Therefore, we reduce the estimation range from -60 to 60 mm.



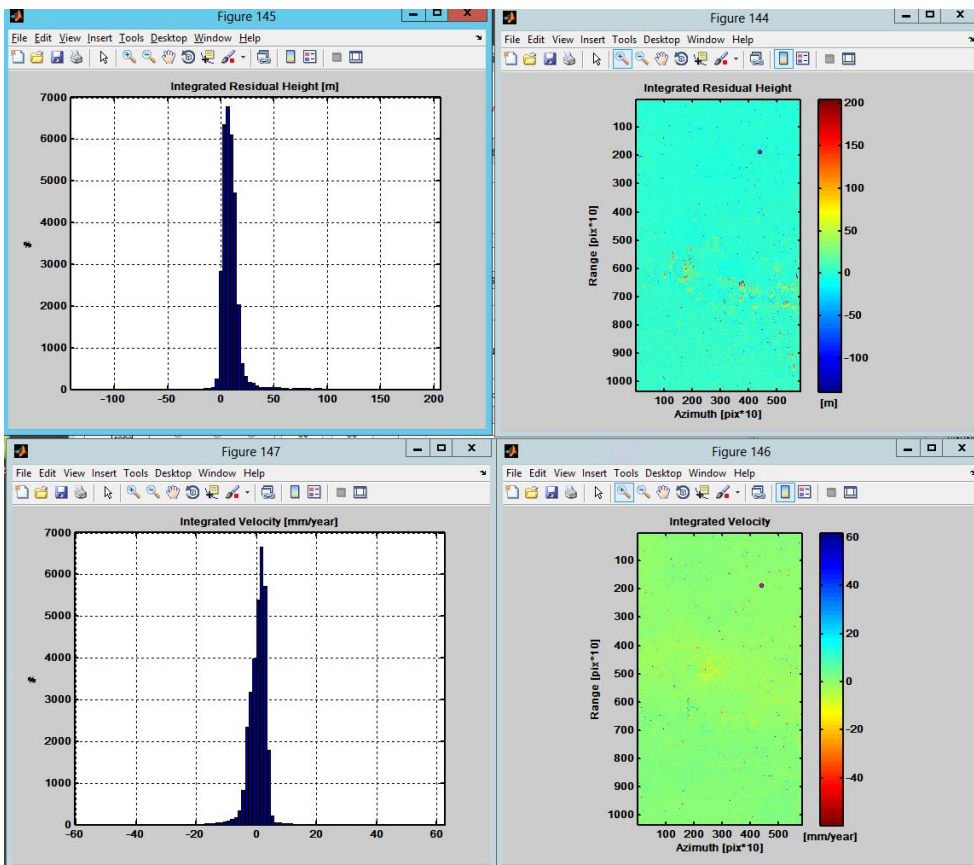
Again we press **Go** in the **Connections processing** group to start the process and see the coherence by pressing **Hist** and **Plot Graph** in the **Connections coherence** group.



We are still using 0.7, 0.85, 1 for the non-linear weighing.

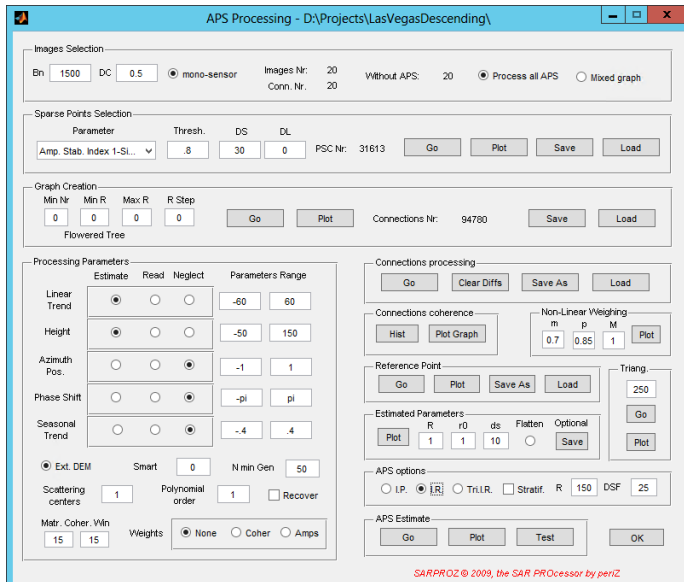


We again select a reference point by pressing **Go** in the **Reference Point** group.

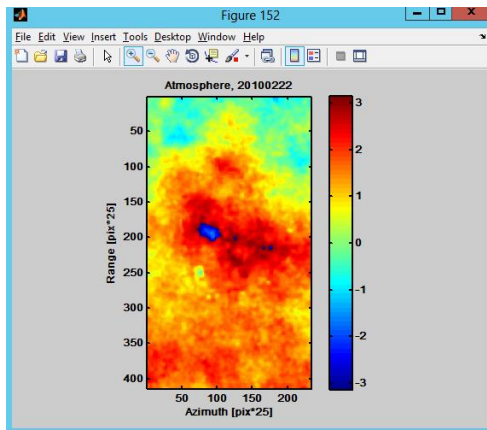


Well, this time we are satisfied with the results. However, we could (and probably should) continue to search for optimal parameters in the above described way.

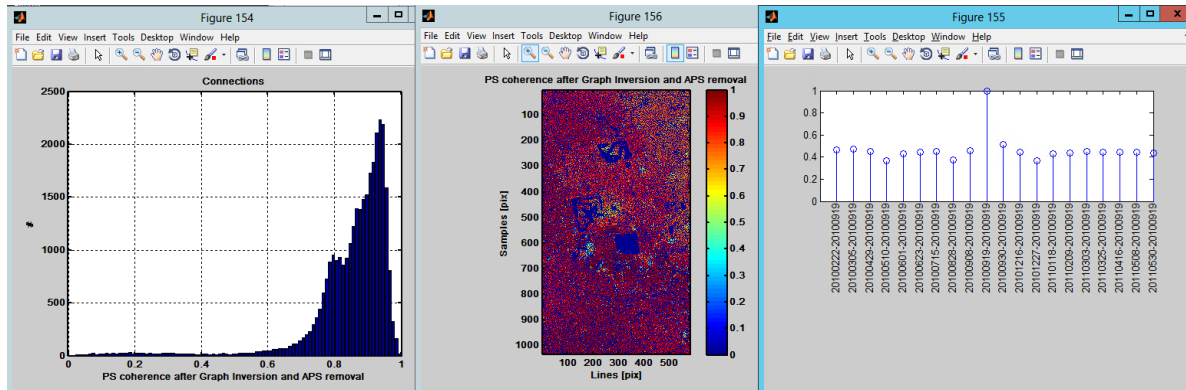
Finally, we go for the APS processing selecting the right option in APS options. I.P. stands for inverse parameters and is a rather stable estimator for the APS. I.R. stands for inverse residuals and can offer better results in good cases, which means cases with coherent and a large amount of data. Tri. I.R. is using triangulation for the inverse residuals. Stratif. stands for stratified and can be used when different atmospheres in different heights are to be expected. Be aware, that to use this successfully, a larger amount of images is typically necessary.



In our example, we select I.R. because we have a very stable and coherent dataset and we are optimistic. The APS is estimated by pressing Go in the APS Estimate group. Afterwards we can plot through the estimated APS by pressing the Plot button in the APS Estimate group.



By pressing the **Test** button in the **APS Estimate** group, we can get an estimation of the APS estimation quality.



Finally, we can close the APS estimation by pressing the **OK** button.