# MAKING A PE CURVE

Here is a step by step method to create a good PE curve that can be downloaded into an equatorial mount, such as the AP Mach1. The data presented is from a production Mach1 mount. This will apply to all Astro-Physics mounts.

1. First step is to acquire data using the PEMPro program with scope pointed to the Celestial equator near the Meridian. The attached image shows data of 3 worm period runs, approximately 20 minutes.

   You will notice that the 3 runs are not exactly the same, but lie pretty much on top of each other within +- 1 arc second. Make sure you check the drift align box. If the three runs are wildly different, then something is wrong with your imaging system (loose focuser, flopping mirror, scope flexure, very bad seeing, etc.). This will result in bad data and should not be used to create a PE curve.
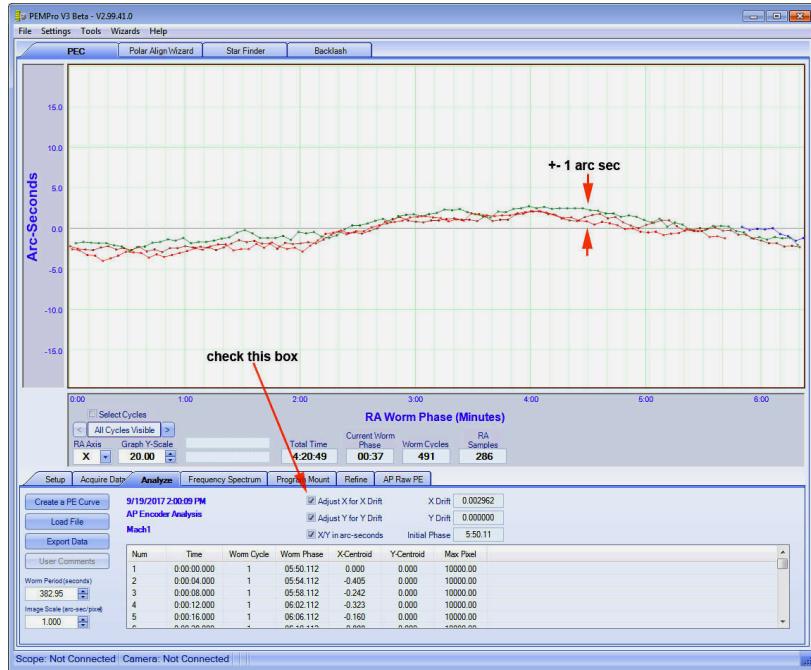
2. Next step is to create a PE curve from this data. Press the button to create new PE curve. A new window will pop up which shows a basic fitted curve with the major harmonics and their values.

3. Now we are ready to analyze and create a best fit PE curve by using the different Drift Fitting methods and adding the relevant harmonics that will lower the RMS value shown in the upper right window. Harmonics up to the 16th can be used if they have values above .05.

   Once you have minimized the RMS simply press the lower right button to create the PE curve.

The created PE curve will now be shown in the main window and will have the value of the error that is periodic in the mount's drive train. All non-periodic errors are ignored because they would not occur every cycle and would actually make tracking worse if implemented in the PE Memory. These non-periodic errors are small in any case and are usually caused by things beyond the mount's control (poor seeing, scope flex etc).

This value is measured for every production mount at Astro-Physics and is used to determine if the mount meets the stated specifications.
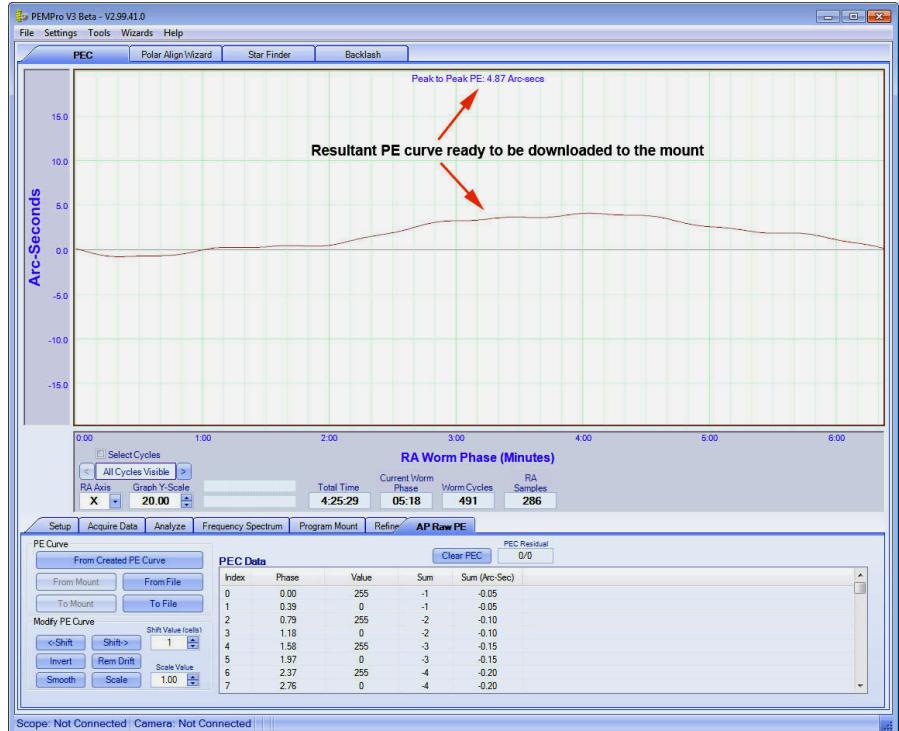
4. Once you have loaded this curve into the controller's memory (CP1 thru CP4), you can now turn on PEM and do one more run of 1 to 3 worm cycles to see how well the mount now tracks.
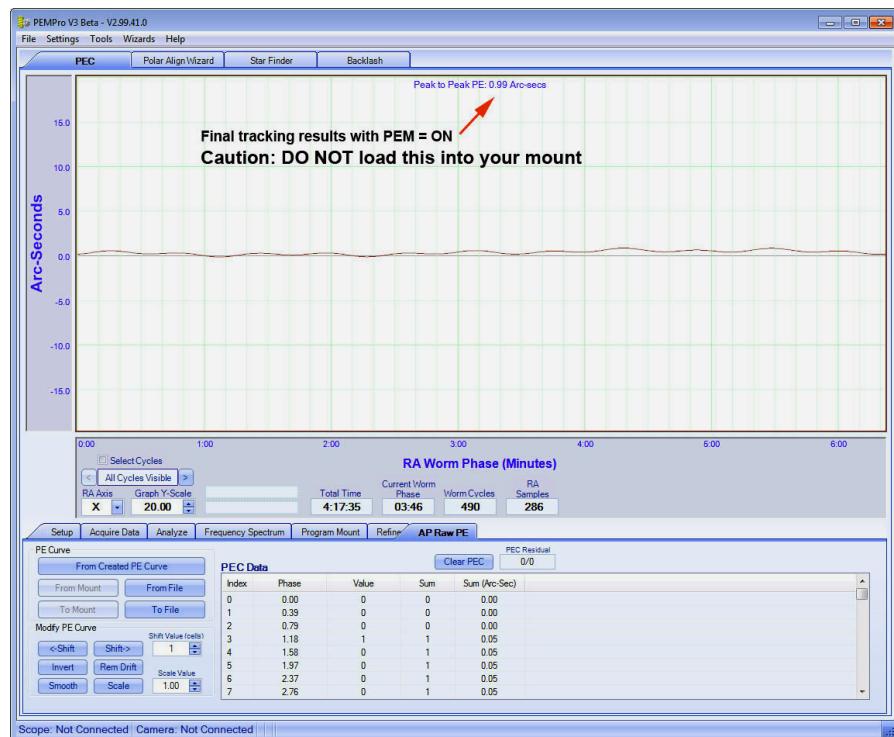
5. Finally you can do an analysis to see what the resultant PE is with PEM=ON and get a value of the tracking accuracy.

Creating this PE curve is the final step, BUT DO NOT download this curve into your mount because you would be right back to having no PE compensation!!