

The TIRF “sa” program was developed to collapse a *hysteresis like* condition. This condition is seen in Slip Angle (SA) sweep testing (FIG 1.). An SA sweep crossing zero SA in both directions yields Lateral Force (FY) data on different lines when plotted against SA (FIG 2.). The separation between these lines increases as SA rate increases. SA points taken statically at 0 degrees will usually fall between the dynamic lines at Slip Angle of 0 degrees (FIG 2.).

Because some customers do not wish to work with this hysteresis like event, TIRF collapses it to coincide with the Static Slip Angle value (FIG 2.). The final outcome is a shift of the Slip Angle scale only. Following is an explanation of how the TIRF “sa” program works:

In this discussion a Slip Angle sweep is any dynamic SA pattern with all other test conditions fixed.

- Preceding each Slip Angle (SA) sweep several points are collected at SA = 0 deg. Pre-zero ( FIG 1.)
- Following each Slip Angle (SA) sweep several points are collected at SA = 0 deg. Post-zero (FIG 1)
- The Pre, Post-Sweep zeroes are averaged and are now called the Static point. ( FIG 2.)
- A linear curve fit is placed through the FY vs. SA data (+/-1 deg.) each time SA crosses 0 deg. ( FIG 2.)
- For each SA crosses 0 deg. segment, SA is shifted until the curve fit coincides with the Static point. ( FIG 2.)

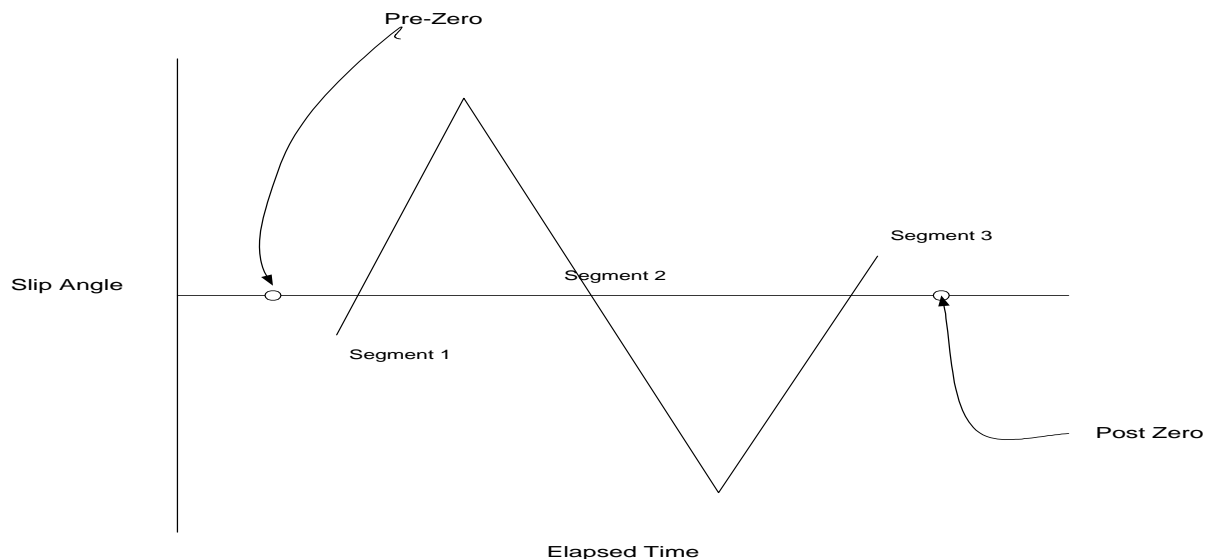


FIG 1.

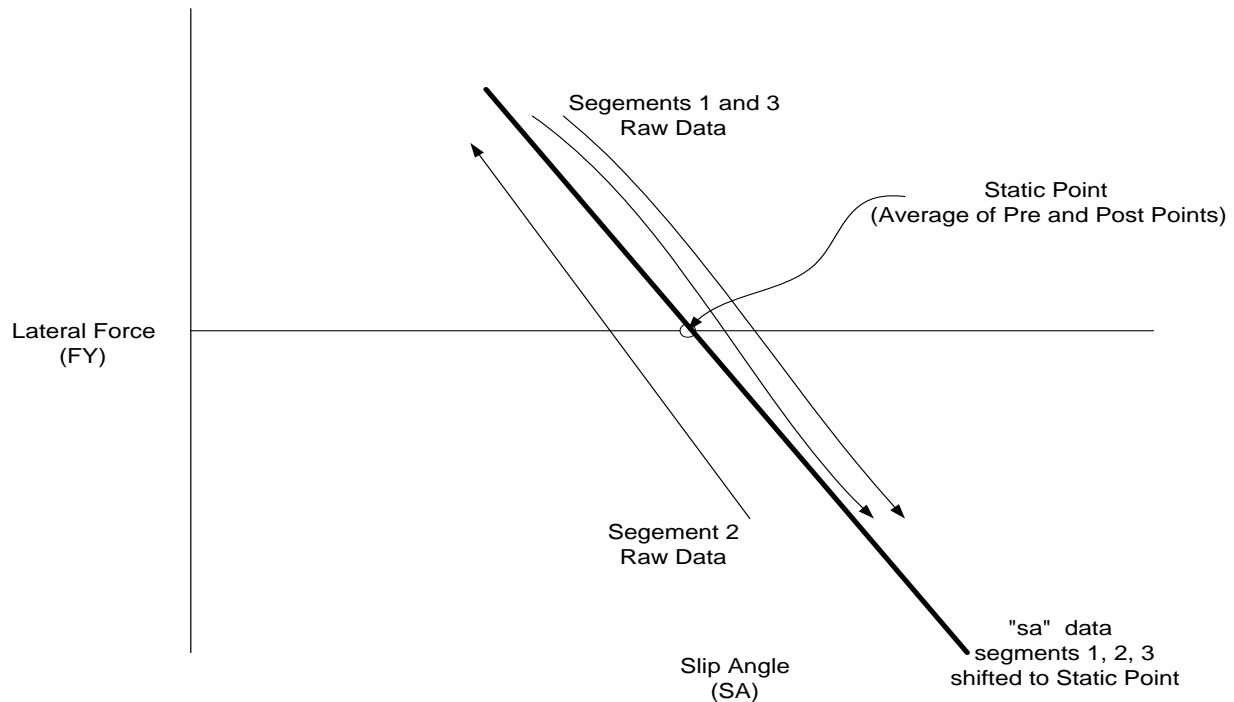


FIG 2.

The Spring Rate and Later Force Zero (FY-0) data come from the Static Pre and Post sweep Points. The spring rate is calculated by placing a 1<sup>st</sup> order fit through all of the pre and post zero FZ and RL data. The FY-0 data is just the average of the pre and post points at each Normal Load. The Cornering Stiffness (CS) and Cornering Stiffness Coefficient (CSC) come from "sa" data. The CS and CSC data are weighted averages of all available segments for a given condition in the range ( +/- 1 degree SA).

In summary, the TIRF "sa" program collapses the hysteresis like effect seen in an SA sweep when FY is plotted against SA. This is done by shifting the SA data relative to the Static Point. If you have any questions please contact me directly.