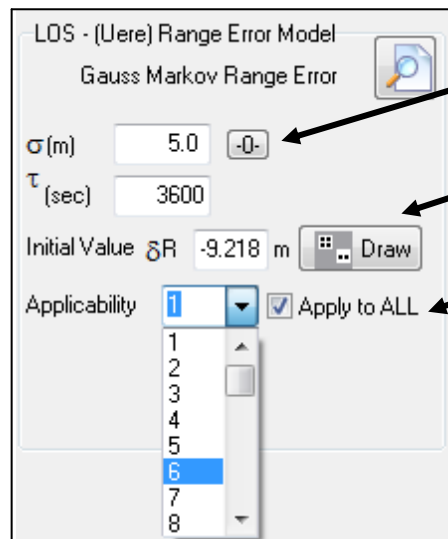


## LOS (UERE) RANGE ERROR MODEL

The Tapestry system simulates modeling errors for the control segment through the use of the User Equivalent Range Error (**UERE**). This model applies a random slowly varying bias to the output range for each satellite – uncorrelated from satellite to satellite – yet perfectly correlated from RF to RF.

The model is implemented as a 2<sup>nd</sup> order Gauss Markov Process with either a user specified initial condition or a random draw based upon a user entered standard deviation.



Use this to zeroize ALL of the standard deviations.

It is important to use the **DRAW** control to set the initial condition in place for the **UERE**. The initial value varies in time controlled by the time constant  $\tau$  and standard deviation  $\sigma$ .

- **Apply to All: NOT CHECKED.** The values in the various controls apply only to the Satellite shown in the pulldown combo box.
- **Apply to All: CHECKED.** Depressing the **DRAW** button will select the initial condition for all 32 Satellites. Sigma and Tau will be the same for all Satellites.

The Computed UERE error is applied directly to the computed range (and the derivative to the range-rate) and therefore does not vary from RF to RF yet does vary from satellite-to-satellite as specified by  $(\sigma, \tau)$ . The following plot illustrates both effects. This example is a two RF run for a stationary host vehicle. To exaggerate the error for illustrative purposes, a standard deviation of 10 meters and time constant of 100 seconds was specified (a more realistic set of values would be 2-5 meters with a 3600 second time constant). As can be seen from the plots, the derived position error from each RF output is statistically identical yet the overall position error for both vehicles is corrupted consistent with the values of the model and the PDOP.

