

## Ellipse X-Y

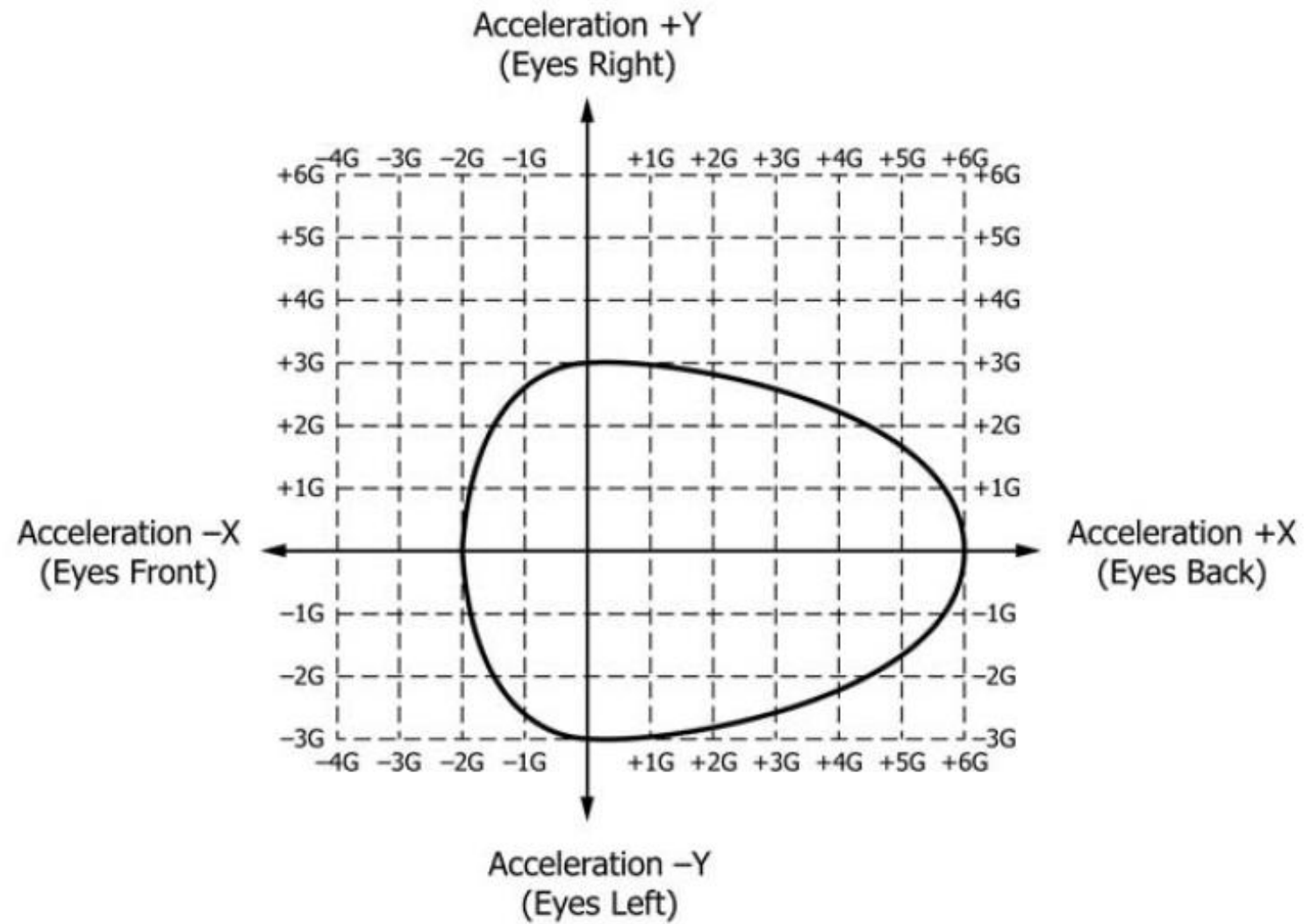
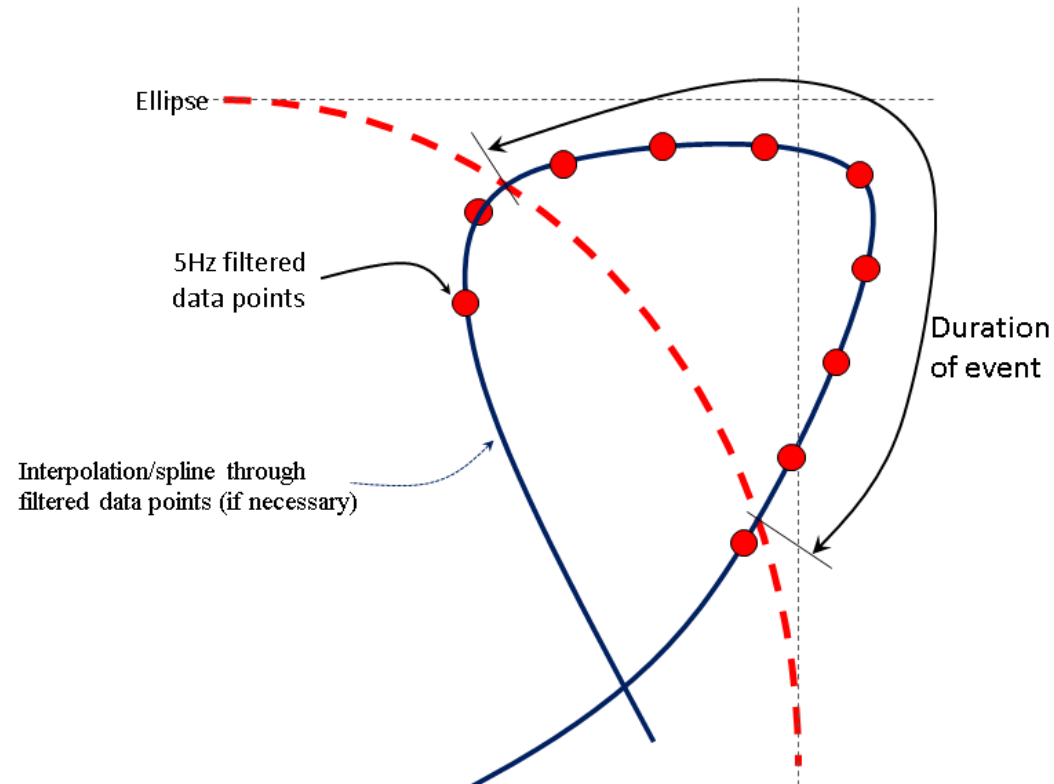


FIG. 12 Allowable Combined Magnitude of X and Y Accelerations

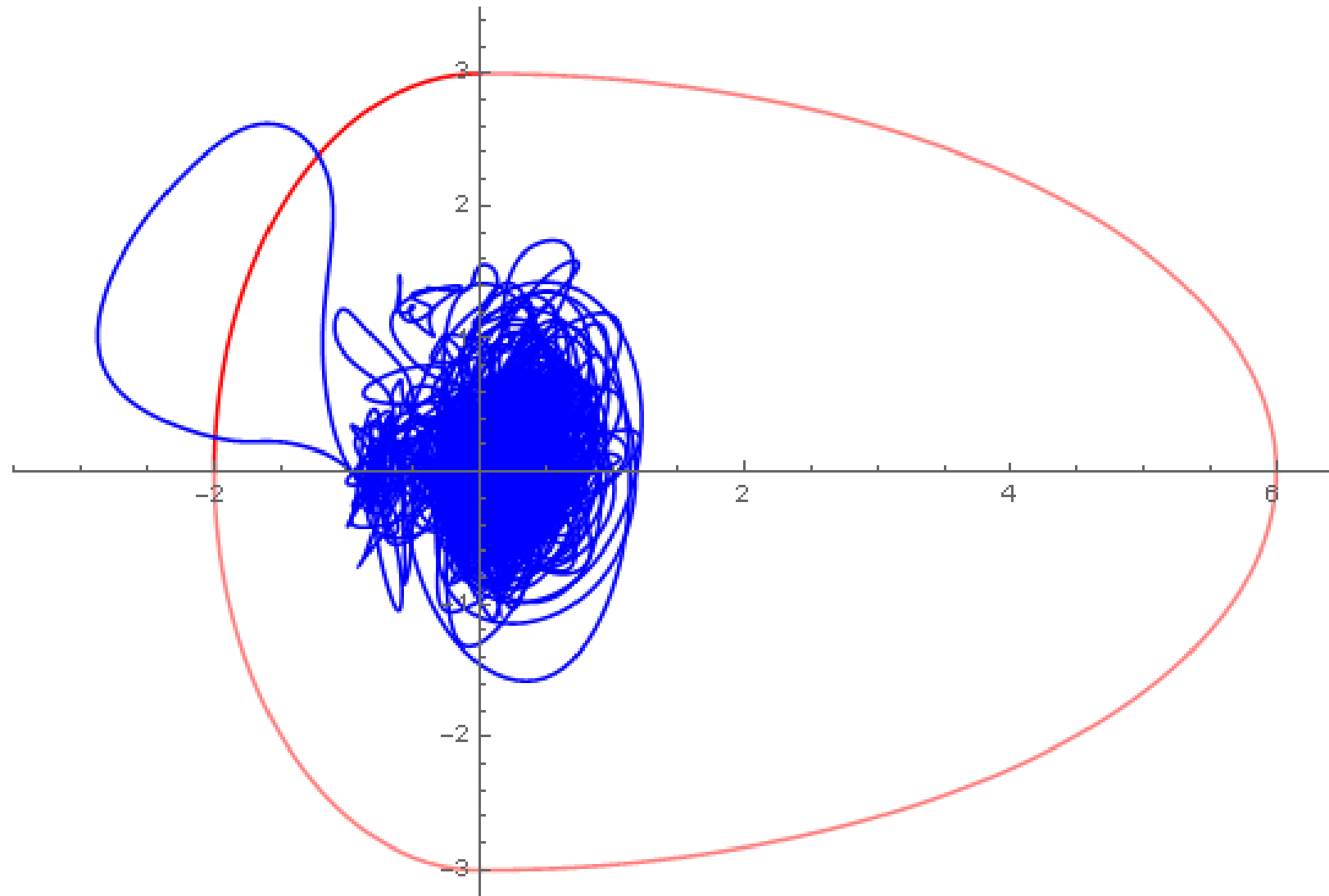
## Process (suggested)

1. Filter both axes data to 5Hz
2. If maximum acceleration for each axis is less than the 40 second exposure limit acceleration for that axis, data passes.
3. If not, plot the pairs of points against the ellipse formed from the acceleration-duration 200ms values
4. Locate all places where the data points traverse outside of the ellipse
5. For each one of these events, calculate the duration that the signal is outside of the ellipse. Note that this may require interpolation between the sampled data points, depending upon the sample rate.
6. If the signal is outside of the ellipse for less than 200ms, the check fails. Note that the signal may exceed the 200ms limits and still be considered as passing

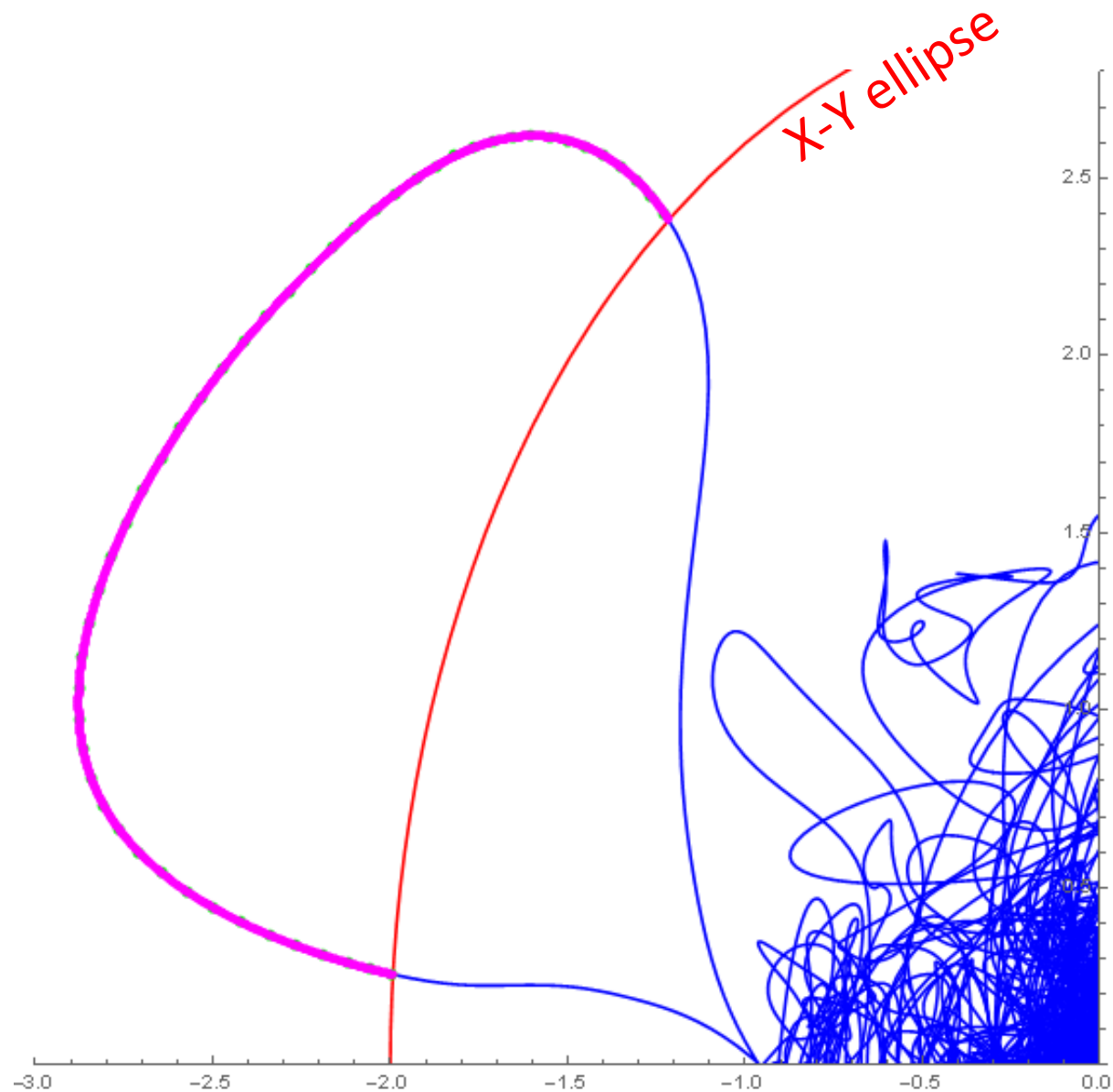


## ASTM\_Ellipse\_XY\_justPasses

Data filtered using a 5.0Hz Butterworth Lowpass 4-pole filter, specifically the Matlab "filter" function



## ASTM\_Ellipse\_XY\_justPasses



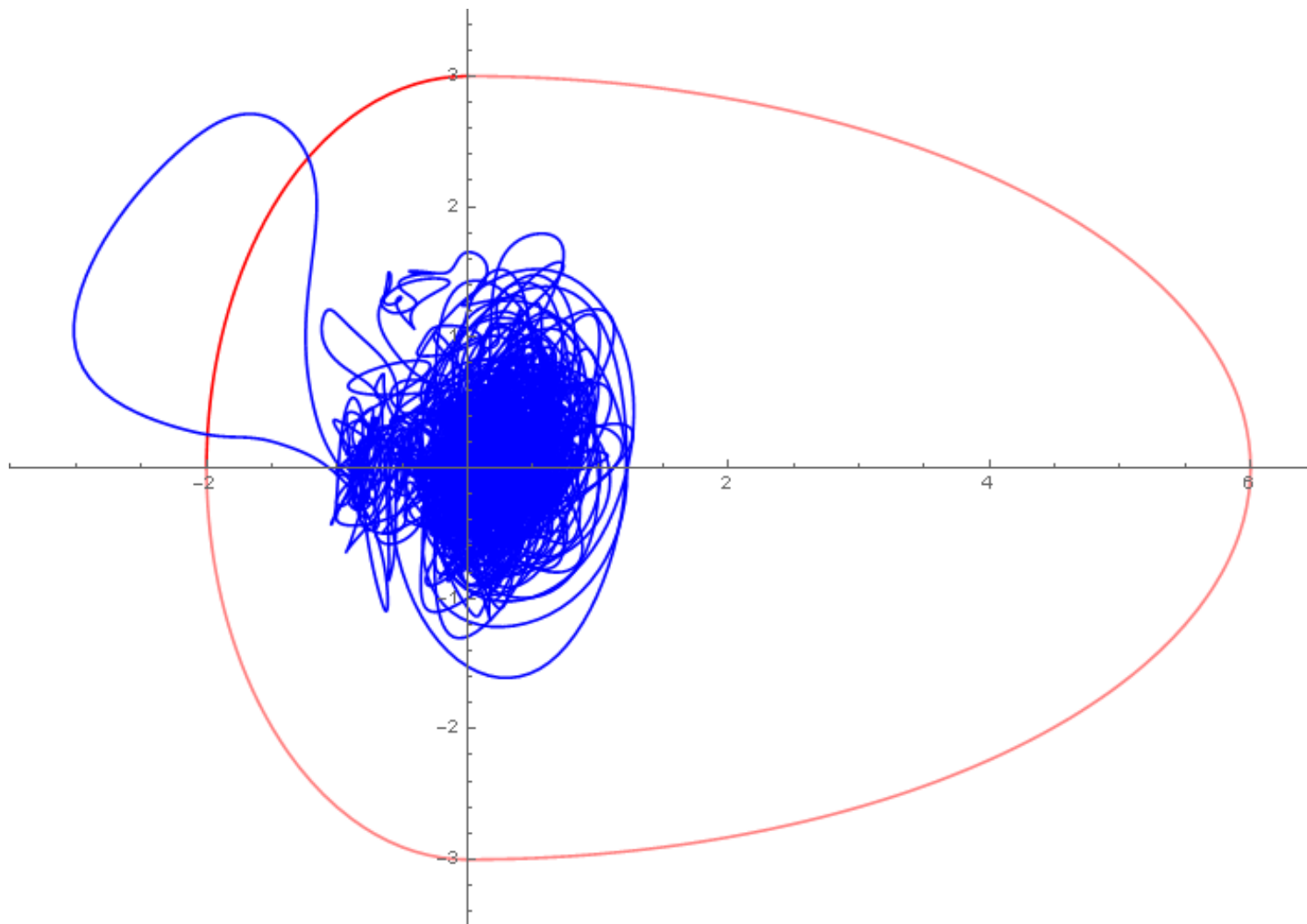
Data filtered using a 5.0Hz Butterworth Lowpass 4-pole filter, specifically the Matlab "filter" function

Start time = 102.461 seconds  
End time = 102.654 seconds  
Duration = 0.1931 seconds

Segment is less than 200ms in duration, thus this run passes

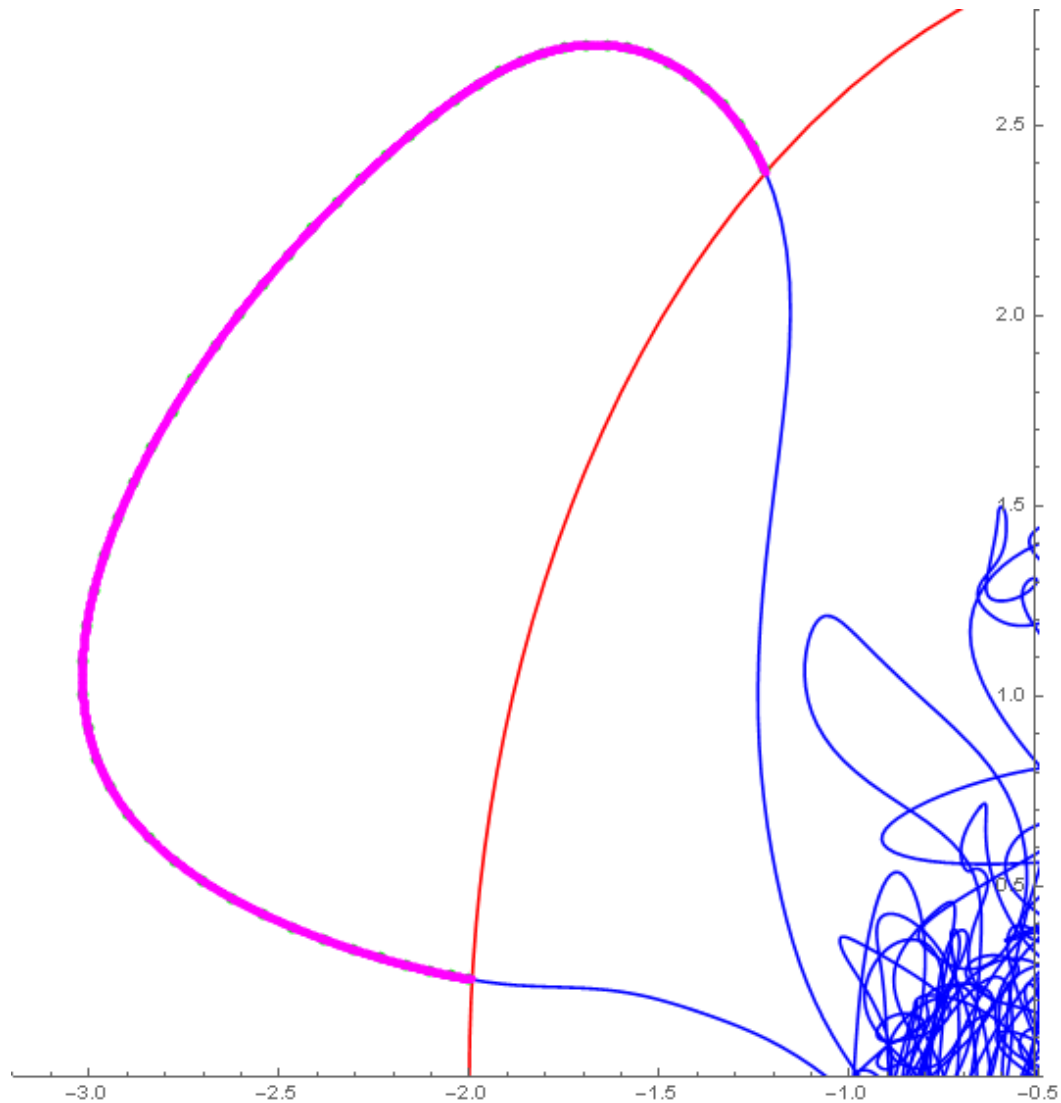
## ASTM\_Ellipse\_XY\_justFails

Data filtered using a 5.0Hz Butterworth Lowpass 4-pole filter, specifically the Matlab “filter” function



## ASTM\_Ellipse\_XY\_justFails

Data filtered using a 5.0Hz Butterworth Lowpass 4-pole filter, specifically the Matlab "filter" function



Start time = 102.453 seconds

End time = 102.661 seconds

Duration = 0.2082 seconds

## ASTM\_Ellipse\_XY\_justFails

Data filtered using a 5.0Hz Butterworth Lowpass 4-pole filter, specifically the Matlab "filter" function

