GPU Solutions for PSCAD: IT17112

Reporting Period	April 23, 2020 - April 30, 2020
Activities	• Discussed discrepancies in the results from CPU and GPU methods with MHI, in particular the issues at lines 2208-2210. • Plotted relative difference between CPU and GPU results for a specific time step (see figure 1). • Issues with these entries are known to MHI and are due to the *Province* sample case being ill conditioned. • Continued to develop solution for running NSight Eclipse in a container on the U of W servers. X11 forwarding through ssh tunnel remains an issue.
Issues	• X11 forwarding from within a container needs to be resolved or a new strategy developed.
Milestones Accomplished	• Resolved the observed jump in relative differences between GPU and CPU solving methods.
Milestones Not Accomplished	• Run QRFactor on U of W servers
Next Week's Milestones	• Compare QRFactor results from CPU and GPU methods for standardized sparse data sets, and for unit vectors. • Compare NVIDIA solutions (both CPU and GPU) with solutions from tested methods, such as Eigen.
Forwarded Issues	• Resolve X11 forwarding from within container in order to run NSight Eclipse through Docker

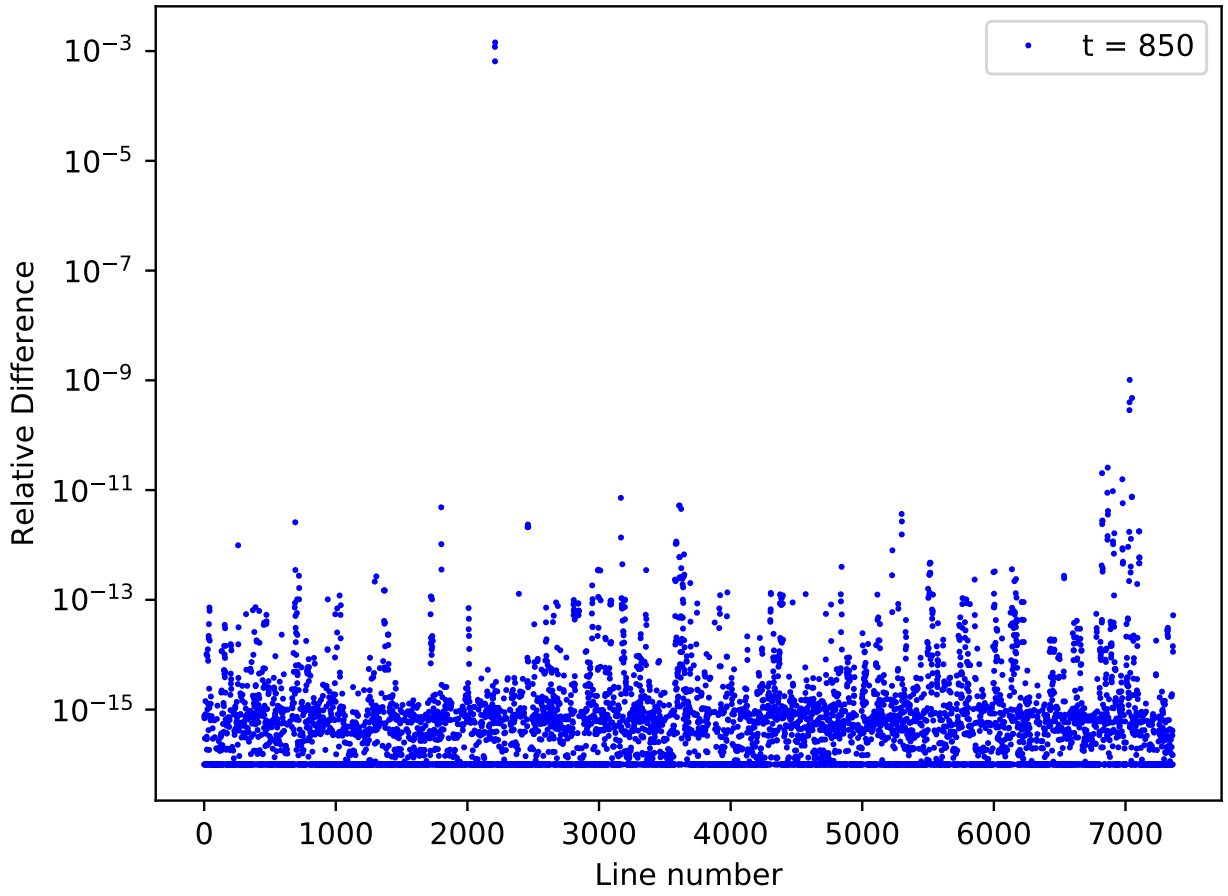

Figure 1: Relative difference between CPU and GPU solving methods as a function of line number for time step $t = 840$. A lower bound of 10^{-16} was used for comparison purposes. Note that values of the three previously identified lines, 2208-2210, are several orders of magnitude larger than the next nearest values.