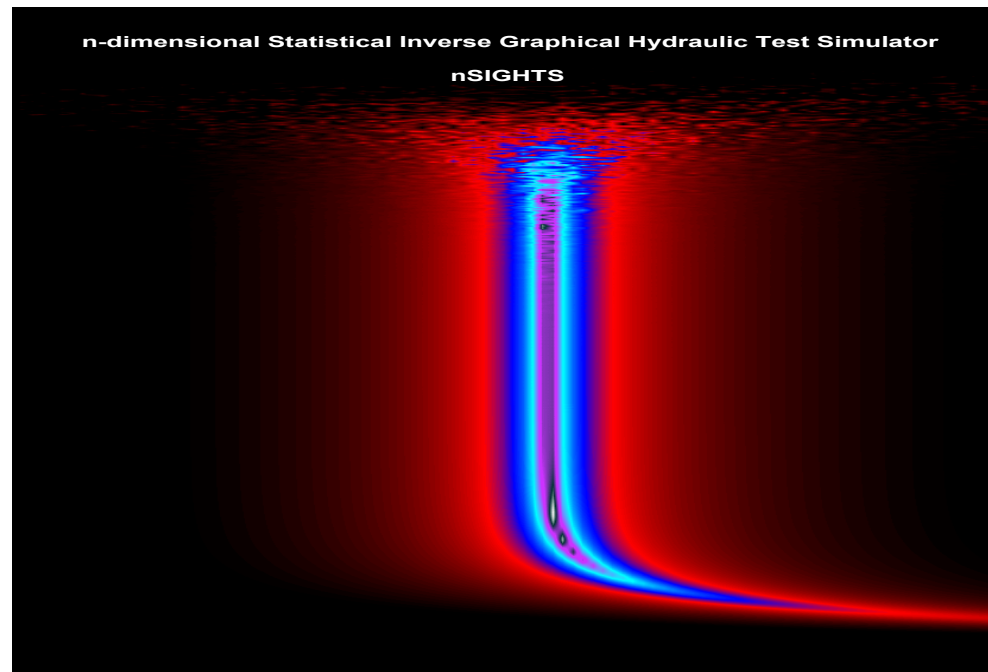


Real-Time Analysis to Optimize Testing Time

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Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company,
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Define Test Objectives

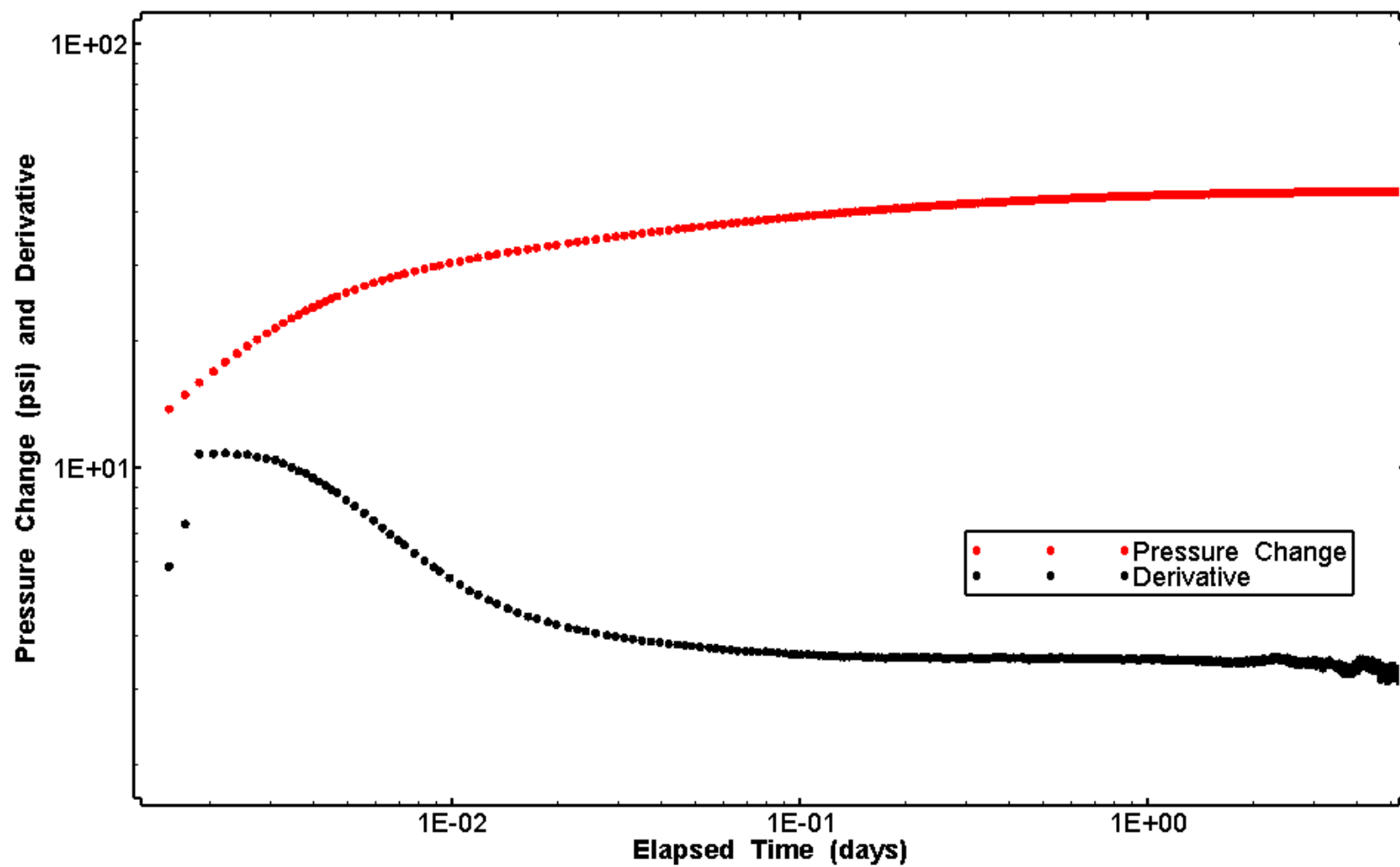
- **Test objectives should be defined before field testing begins**
- **Real-time analysis can be used to determine if test objectives have been met**
- **Ending a test before or long after test objectives have been met can add significantly to the overall characterization program cost**

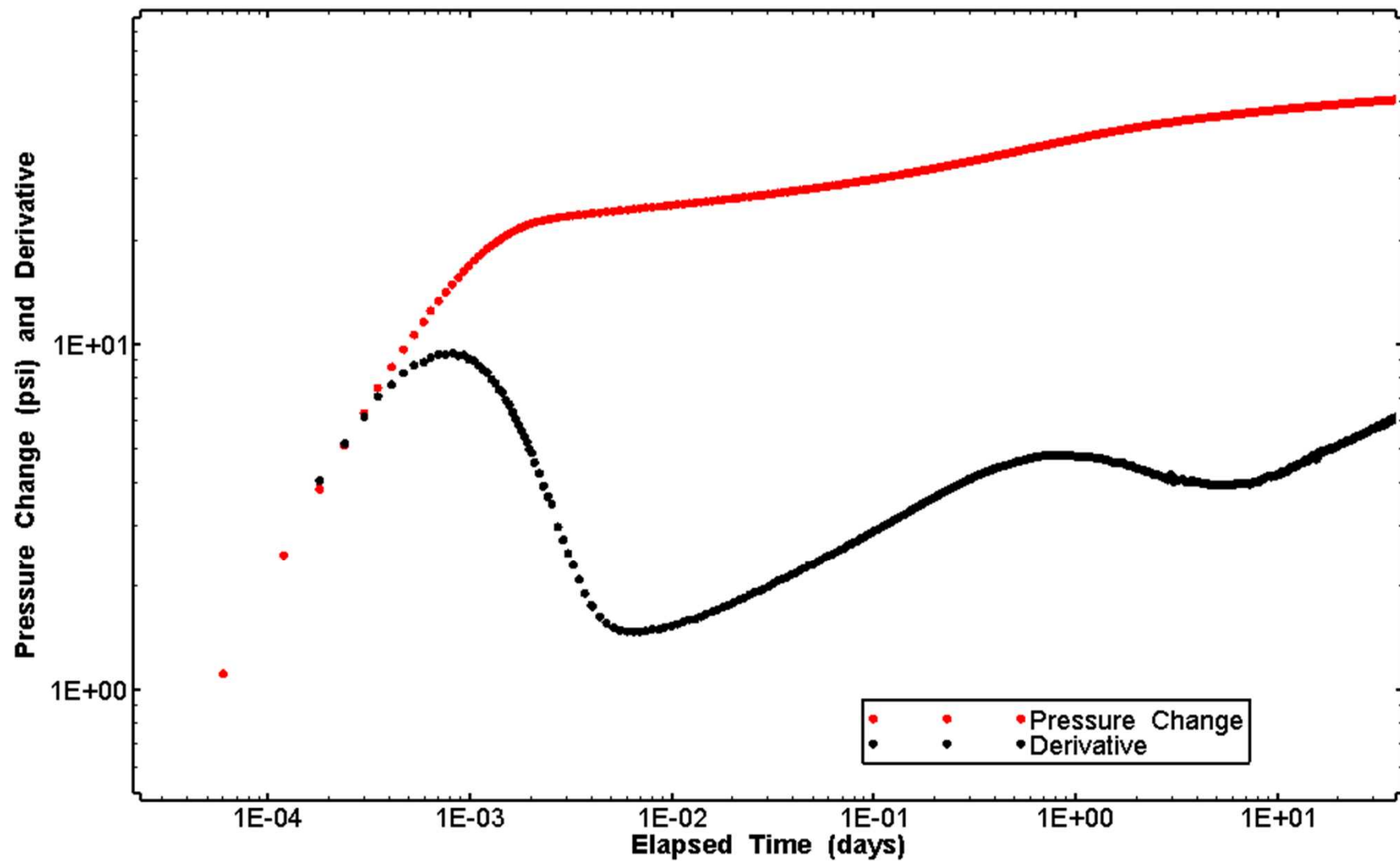
Time-Varying Parameter Information

- The amount of data needed to satisfy stated test objectives can be different for each parameter of interest
- Test design can be used to **estimate** the optimal length of a test, but real-time analysis is the only method that can be used to account for unexpected aquifer responses
- Well-test analysts and the testing personnel must work together to achieve optimal performance

Variable Formation Responses

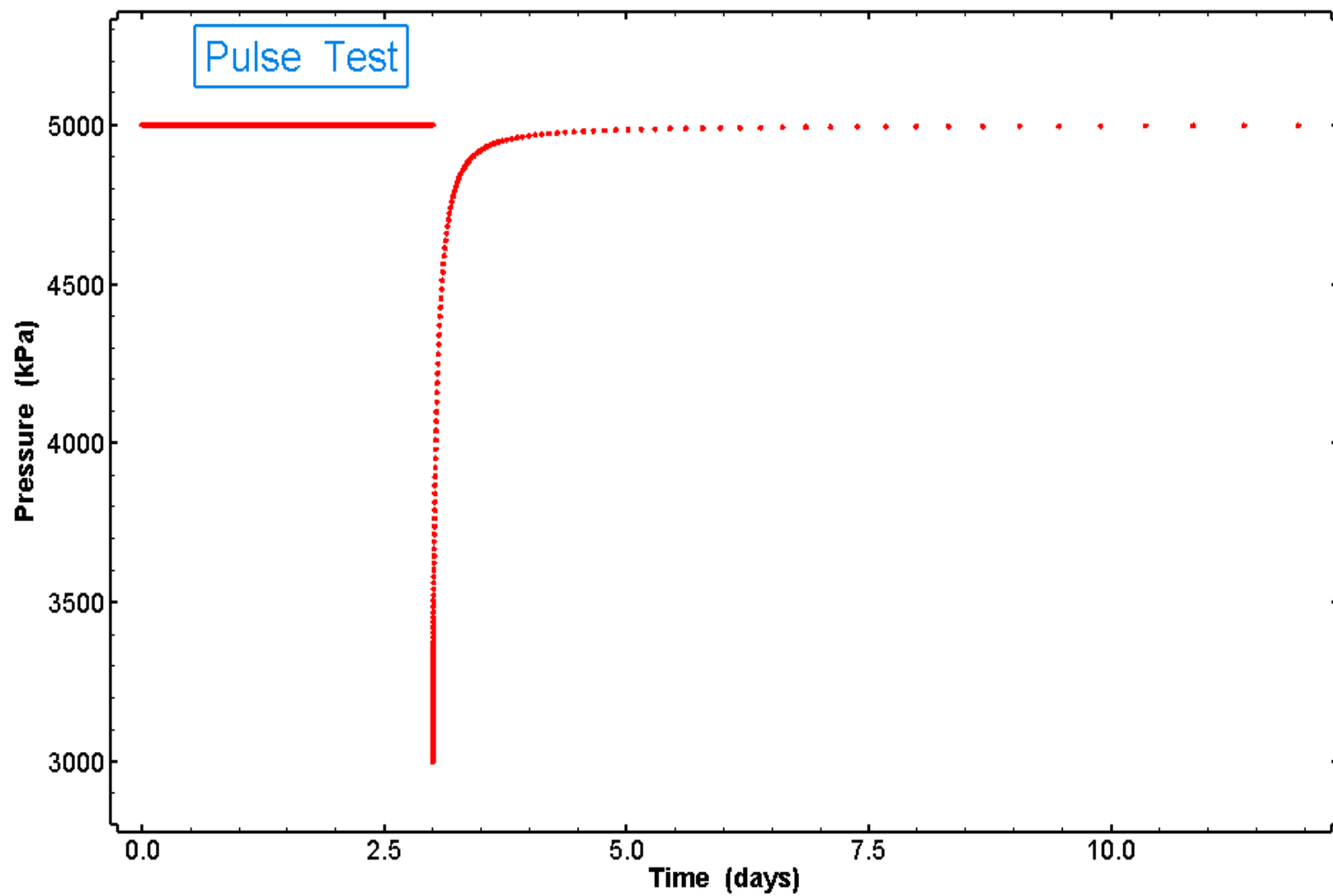
- **A single hydrogeologic unit can exhibit dramatically different responses at different locations**
- **Expected pressure responses that were used for test design can be very different than the actual test response**

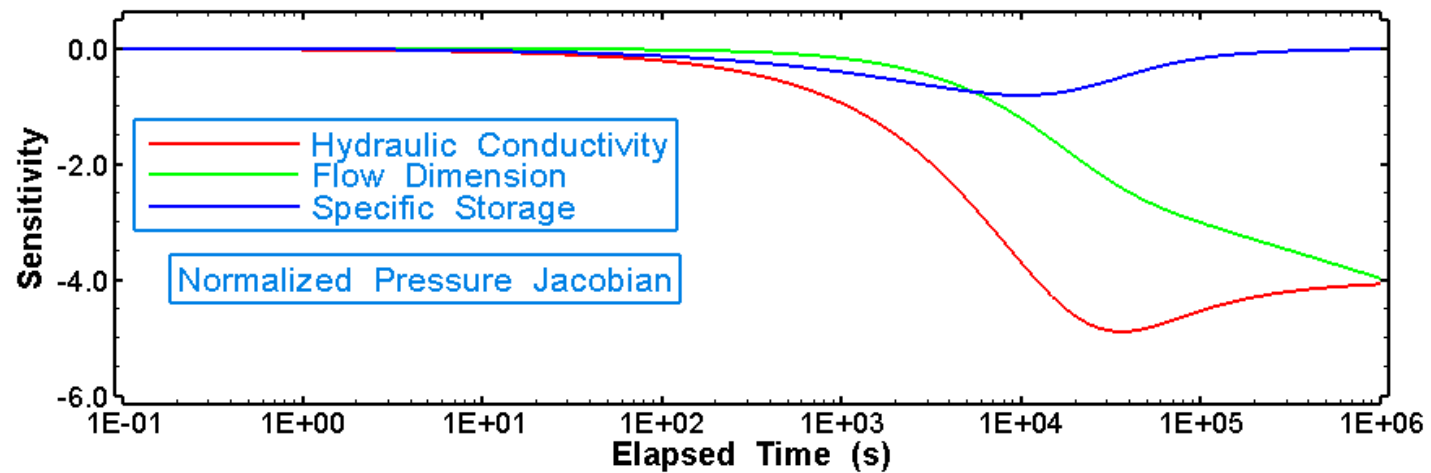
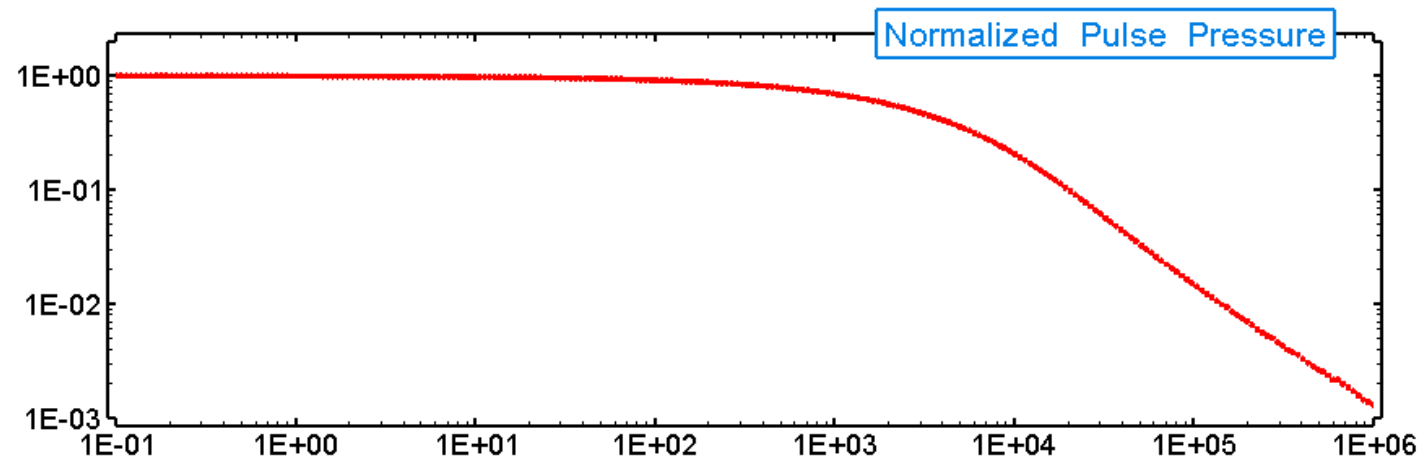


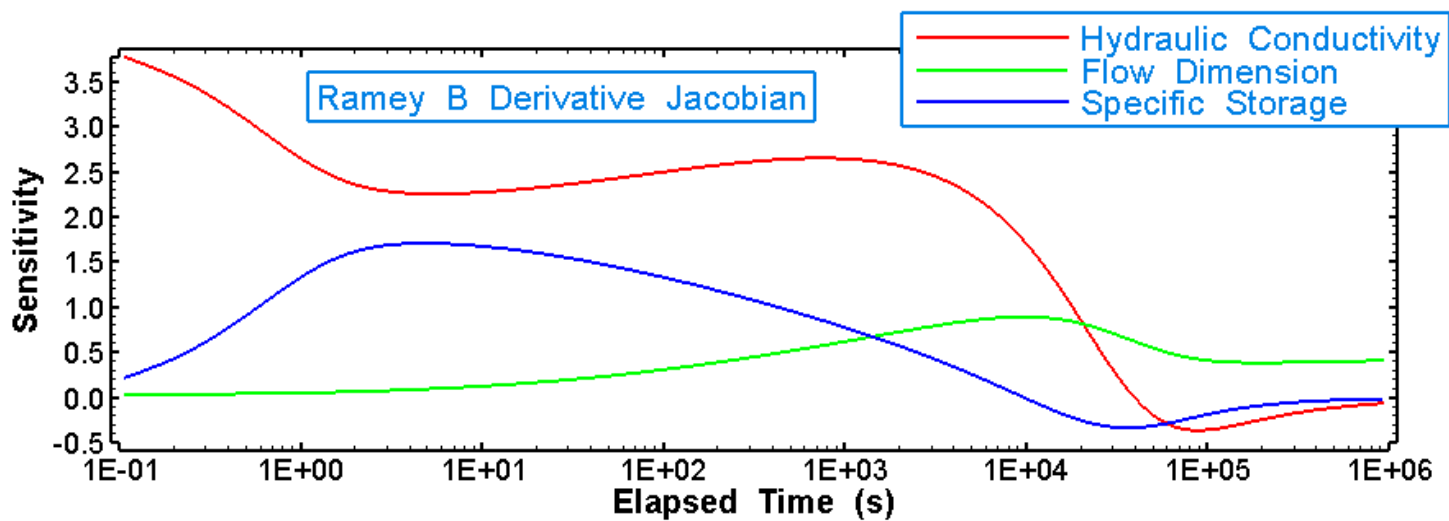
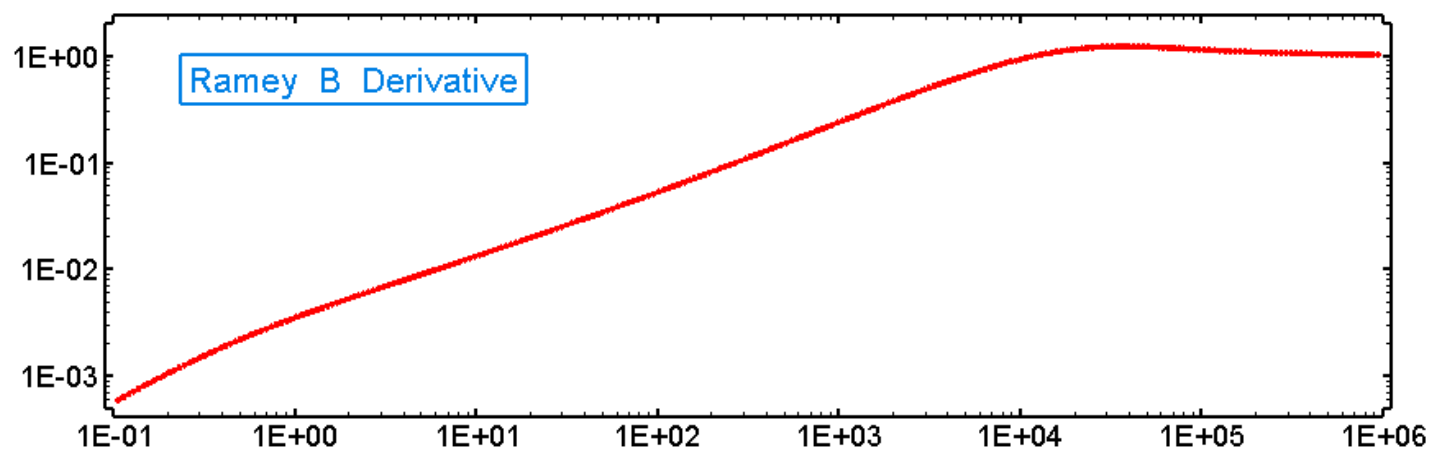


Optimal Constraints

- **Use constraints that exhibit maximum sensitivity in minimal time for the parameters of interest**

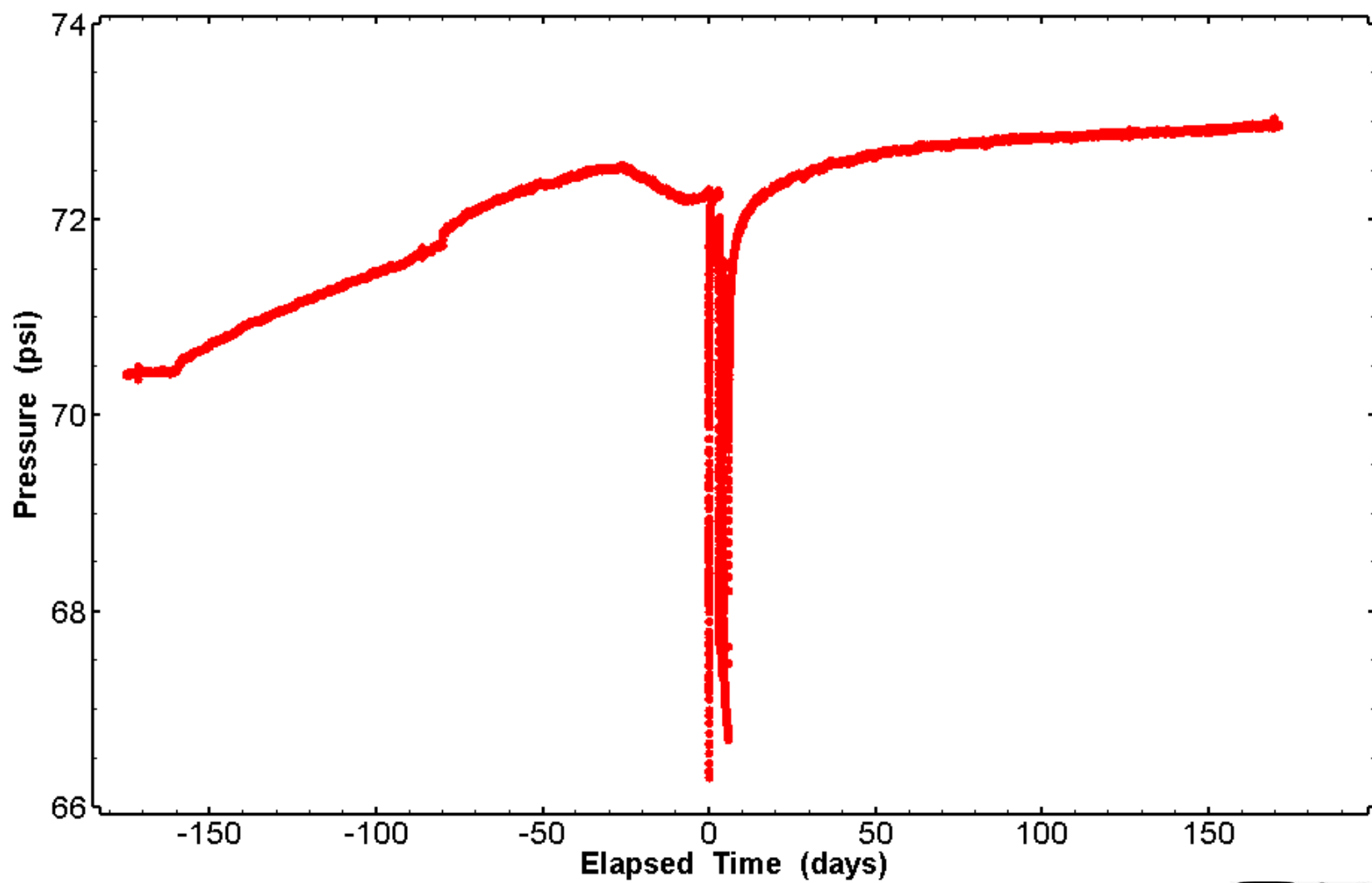


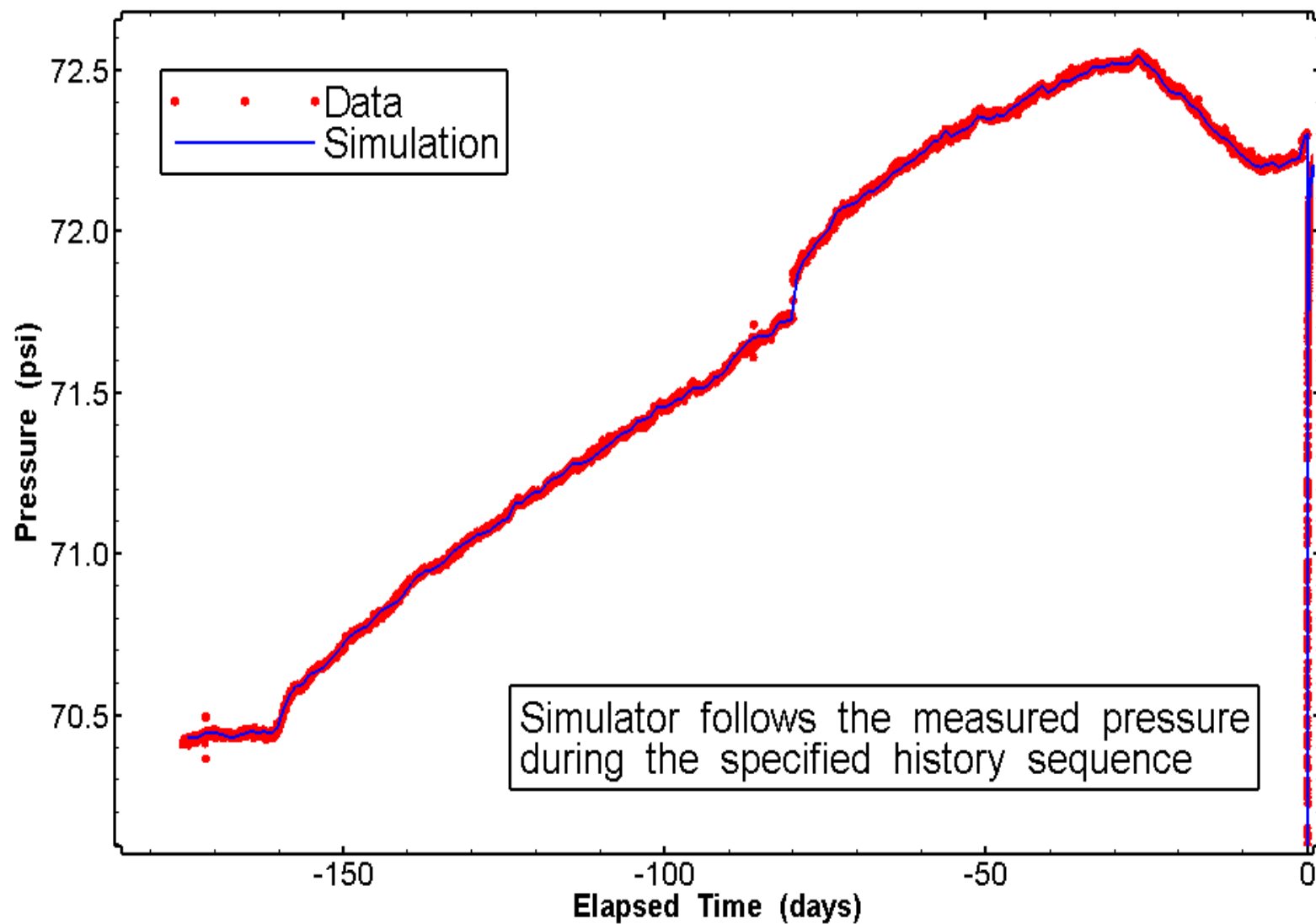


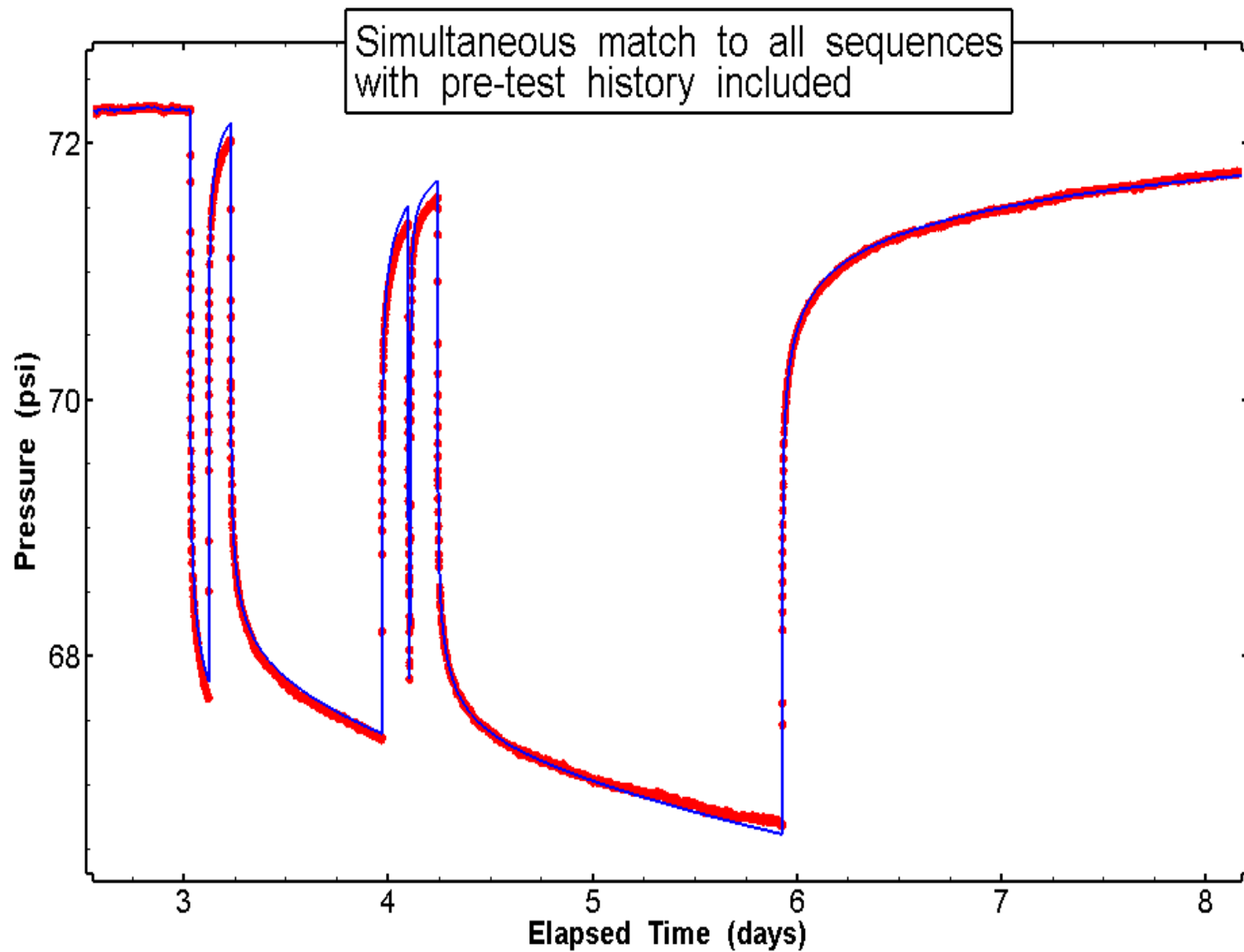


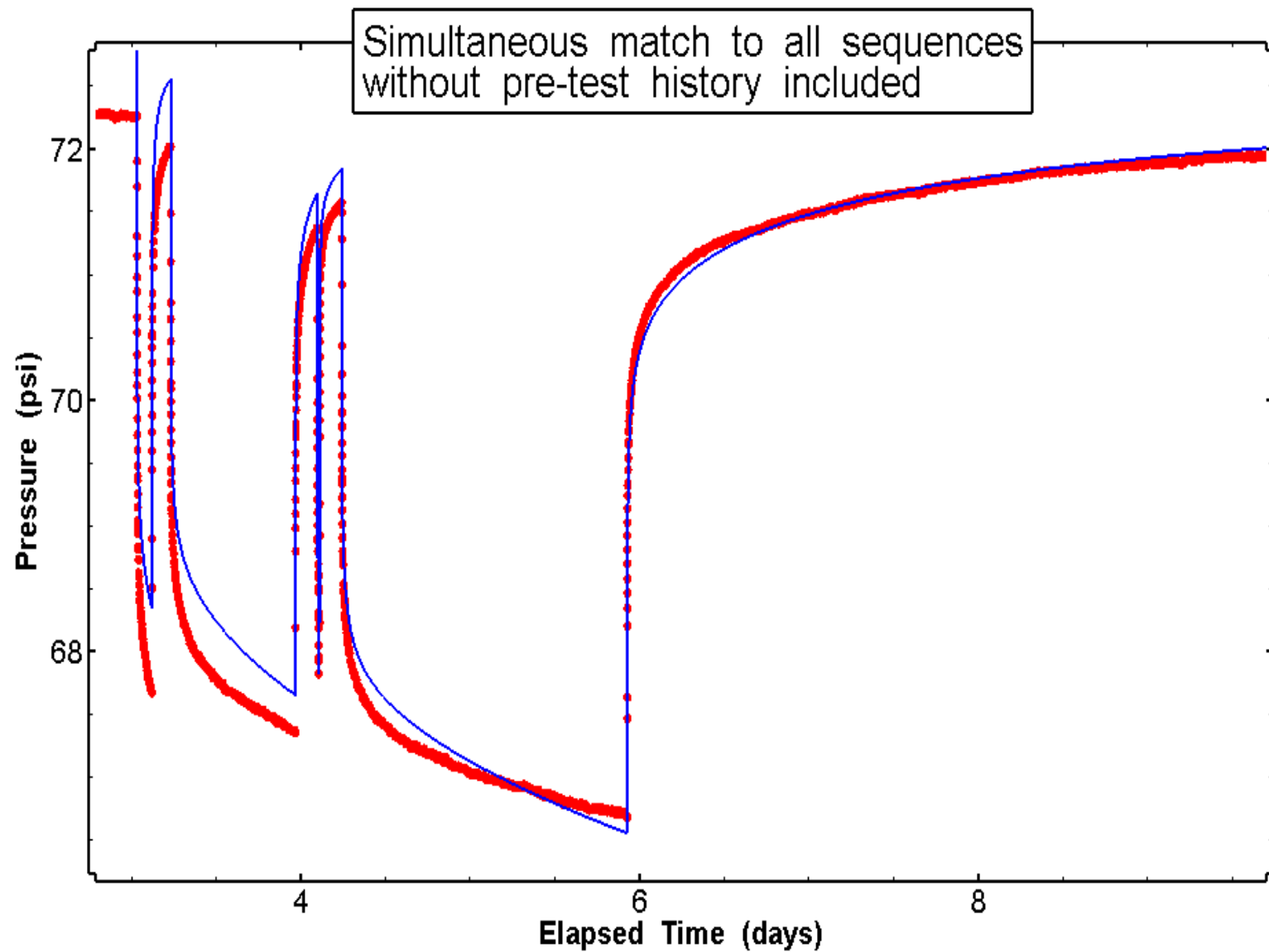
Plan Ahead

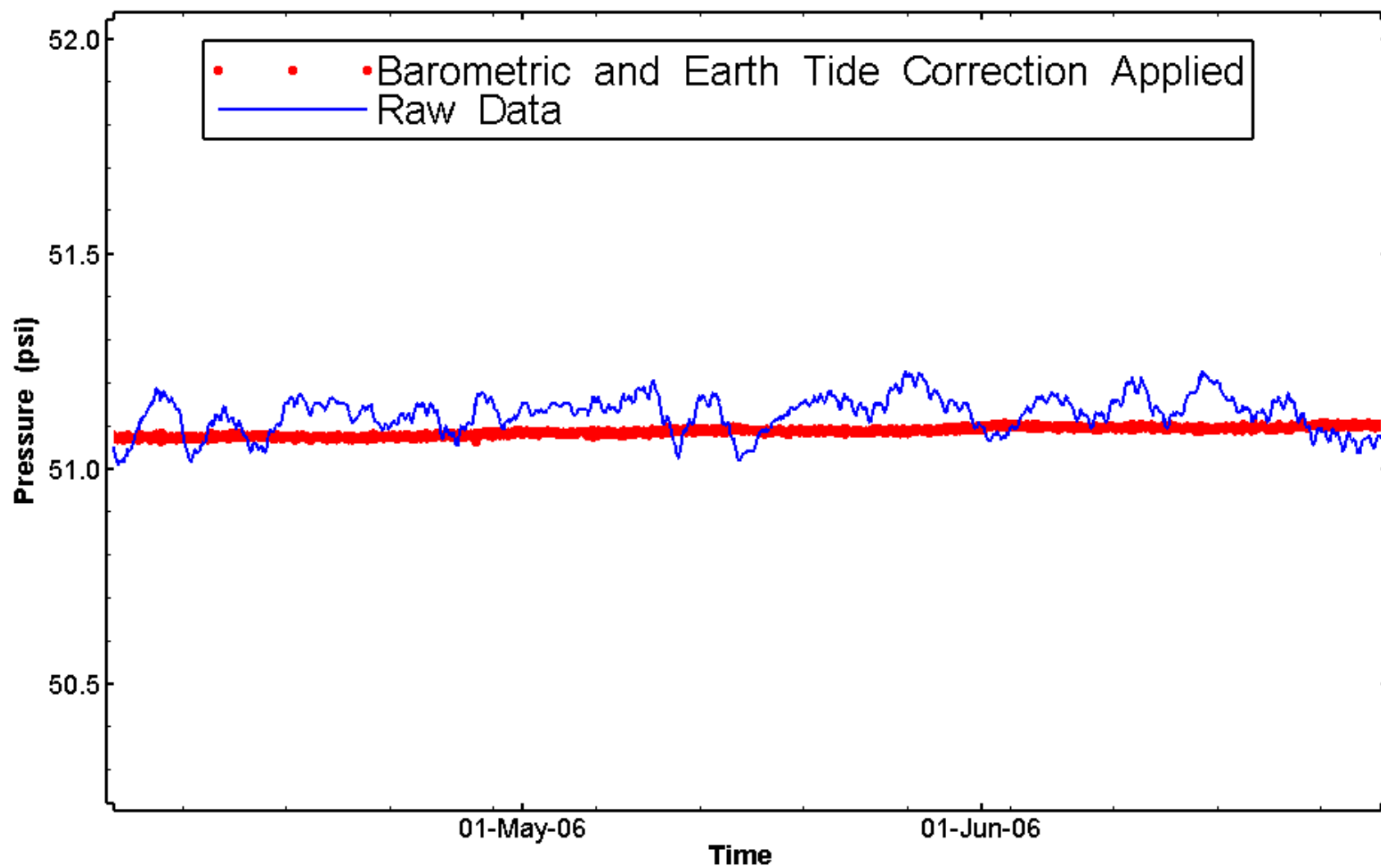
- **Real-time analysis often requires data to be collected weeks before testing begins**
 - **Pre-existing pressure transients can make analysis difficult if they are not included in the analysis**
 - **Removal of barometric and earth tide effects from test data requires approximately 4 weeks of pre-test data**

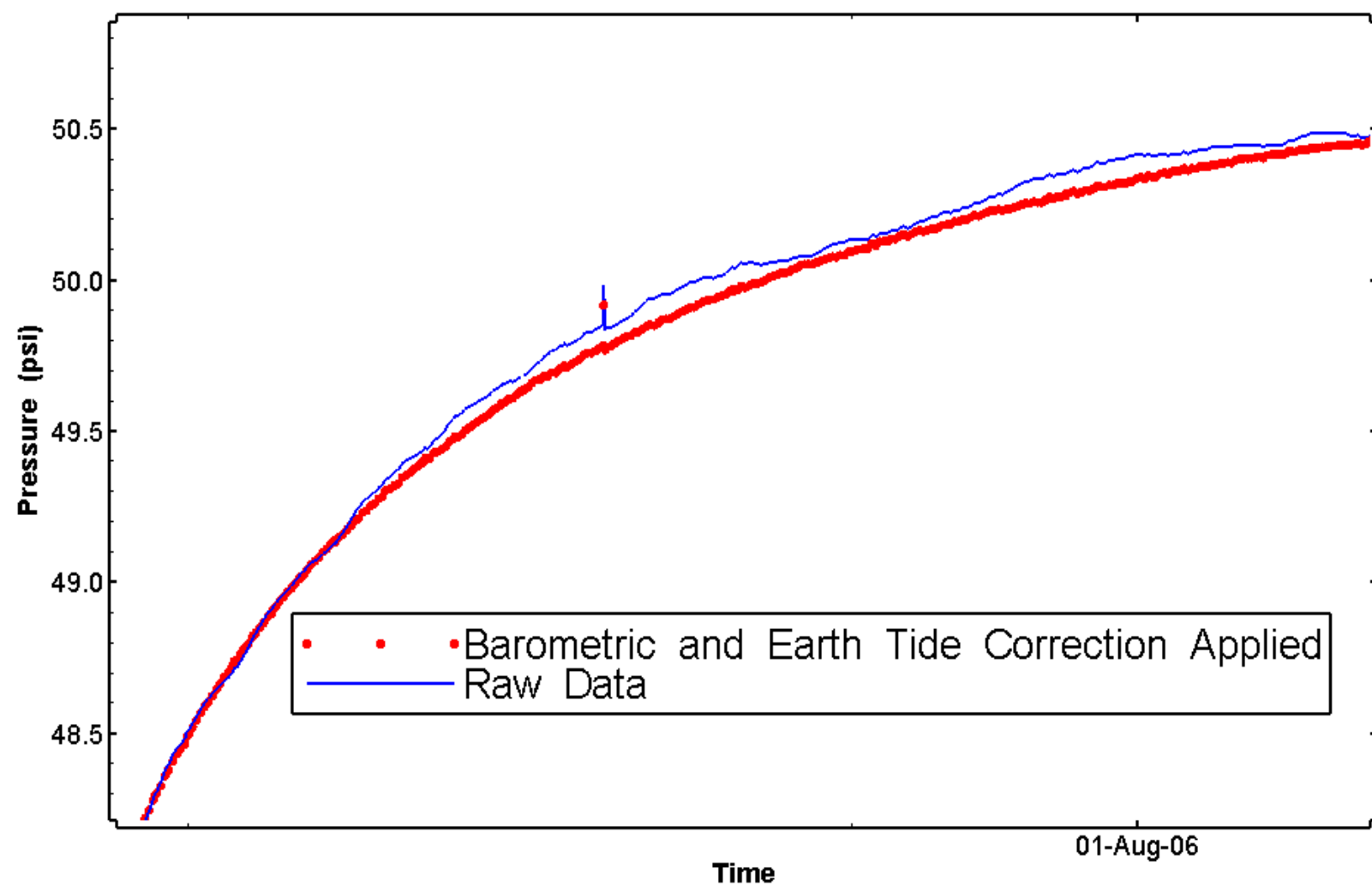




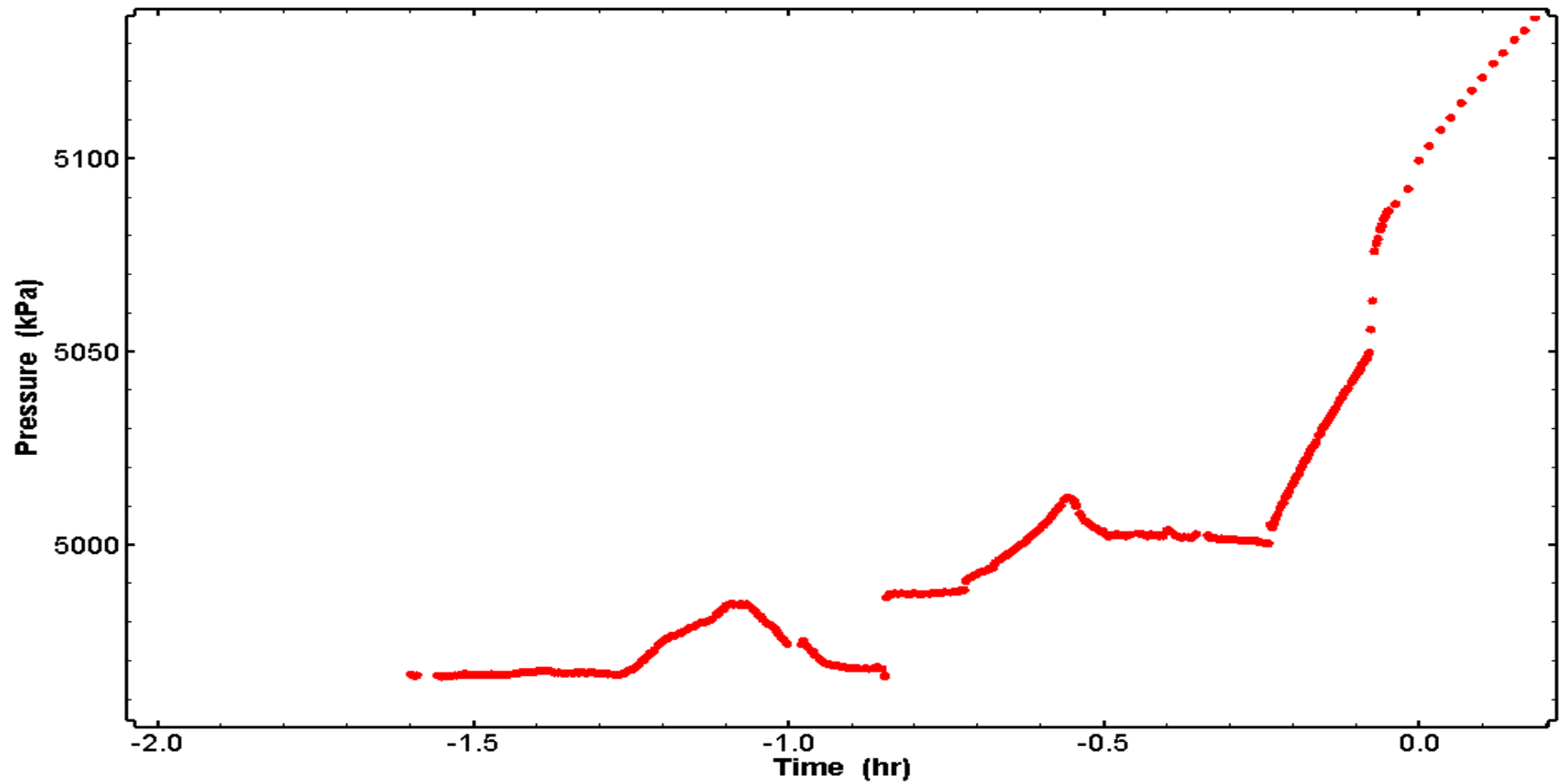








Equipment Issues



Summary and Conclusions

- **Test objectives should be defined before testing begins**
 - **Real-time analysis ensures optimal data collection and test duration, resulting in cost reduction**
- **Both the field testing personnel and the data analysts should be familiar with the objectives**
- **Good communication between field testing personnel and data analysts is vital for successful testing**
- **Real-time analysis permits optimal handling of unexpected results and events**