

## **RELIABLE NOISE MEASURE IN TIME-GATED NMR DATA**

*Trevor Irons, University of Utah; Brian McPherson, University of Utah / Energy Geoscience Institute*

Time gating is a commonly used approach in the pre-processing of nuclear magnetic resonance (NMR) data before Laplace inversion. Gating suppresses spurious signals that can degrade recovered decay time distributions and therefore often stabilizes inversion. However, care must be taken in applying this technique to real world data where both non-Gaussian and correlated noise decrease the efficacy of noise reduction through stacking. If not properly accounted for, unreliable noise estimates introduce inversion artefacts through over- or under-fitting of the data. Fortunately, noise realization proxies obtained through data phasing can be used to estimate reliable confidence intervals for the windows. Benefits of the approach are demonstrated through inversion of synthetics and field data. Borehole data from a deep carbon capture and sequestration application are presented as well as surface NMR data from a near surface groundwater application.