**Impacts of Latency on Temsense One-pass Classification Results**

Latency corrections are key to producing accurate inversion results from AGC data. Visual inspection for herringbone patterns or alignment of response peaks in the IVS data may not be sufficient, despite passing metrics. Several QC seed failures identified within initial data reviews led to an investigation in which the impact of minute adjustments in Temsense instrument latency on classification efficacy was evaluated. Through evaluation of IVS data from several points throughout the project timeline it was determined that very slight adjustments in latency of < 0.05 seconds have a measurable impact on classification results despite providing consistently passing detection results.

Using Temsense data from multiple dynamic IVS datasets over three targets with RTK and SLAM positioning systems, we applied multiple latency corrections in 0.01 second increments over a 1.2 second window. Results were inverted and classified to find the match metric, fit coherence and source offset. Plotting these against the latency allowed us to select the optimal latency for the project and confirm ongoing latency values. This necessitated a compromise between competing metrics, as each metric displayed a different optimal value even for a single target and a single pass. Multiple passes and different items produced consistent results, but over a range of possible latencies.

Results of the latency analysis were applied to one-pass grid datasets where QC seed failures had been encountered, and the classification results were assessed using the optimized latency values. Improved match metric and fit coherence results were observed within the production data leading to passing classification results.

A graph showing a graph showing a number of different colored lines

Description automatically generated with medium confidence