Dynamic AGC data filtering for selection of geologically suitable background locations.

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Cued AGC data processing relies on frequent background measurements to remove responses related to instrument self-signature, time-dependent drift and spatially varying geology. Typically, dynamic surveys of the area are conducted in advance in order to select targets for cued follow-up and locations for static background measurements. Background locations are then tested for anisotropy with a static background verification test before being used with production data. Often, background readings taken within a reasonable time-window from the production data prove to be inadequate and must be replaced with background data collected at a different location. This is a difficult parameter to trace since the effect is not usually observed until classification results are compared to the ground truth – either through QC seeds or intrusive investigations.

Background measurements within a reasonable time-window can reliably be used to account for the instrument self-signature (which does not change with time or distance) and instrument drift (which is assumed to be small or at least linear between readings). Spatially varying geology, however, is more complex. Backgrounds are chosen based on dynamic readings which are deliberately filtered to remove geology so that isolated targets can be more easily identified. This renders them a poor tool for assessment of geologic variability across a site.

This paper presents several examples of data filtering which may have an impact on the quality of background selections. It also recommends a workflow that includes generating a separate site map with minimal filtering solely for selecting background locations and grouping them with targets within the same geologic background.