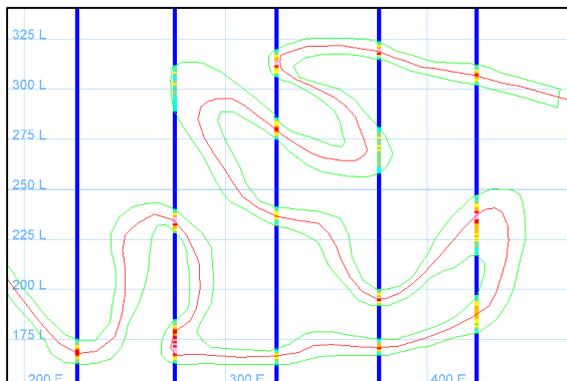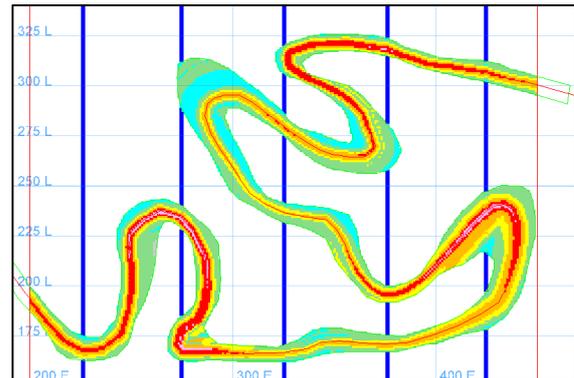# Estimation with Complex Folding

Unfolding

In instances where stratigraphic units have been subjected to folding, or where the mineralisation continuity does not follow a planar orientation along strike or down dip, standard methods of variography and interpolation using linear vectors in space often do not provide a good representation of continuity. One way to account for this would be to subdivide the deposit into domains of almost constant dip orientation and perform variography for each domain independently. However, this would probably result in very few sample pairs for some domains and be extremely time consuming. An alternative method, which ensures maximum correlation, uses an unfolding plane to relate samples from adjacent drill holes.

Most mining software packages provide unfolding for block grade estimation where gentle or simple folds are present, but cannot handle recumbent or complex folds, as shown below.

Estimation with Complex Folding

Martlet Consultants have developed an unfolding method that is suitable for block grade estimation in the presence of complex folds, as shown below. In this example, the unfolding takes place relative to an unfolding surface (red line) that correlates drill intercepts of higher grade values. In other words, when estimating a block value the search for drill hole samples follows the orientation of the unfolding surface. Note that, even if a drill hole fails to intersect the full stratigraphic sequence (eg just the fold nose and not the higher grade core of the mineralised zone), samples from adjacent drill holes are used to ensure that higher grade blocks are estimated where interpreted by the unfolding surface.

Note: blocks smaller than required to produce robust estimates have been used to demonstrate the unfolding process.

If you would like to discuss resource estimation with complex unfolding on your exploration or mining project please contact:

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