Drag folding in the northeastern Thor-Odin culmination, Monashee complex, British Columbia

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Kinematics of regional flow are inferred from the geometry of large scale folds, based on 1:5000 structural mapping in the northeastern Monashee complex. The Monashee complex is located in the Omineca Belt of the southern Canadian cordillera.

Three major folds are found in the study area. These are the Begbie anticline, Mulvehill syncline, and Tilley anticline, listed from north to south. Based on map-scale overprinting relationships, the Begbie anticline is interpreted as an F2 fold, overprinted by the Tilley anticline and Mulvehill syncline, both F3 structures. The asymmetry and style of the north-northeast verging Tilley anticline suggests that this fold developed as a drag fold in response to a non-coaxial flow.

The model presented here suggests that the early-formed F1 and F2 folds are also drag folds that have undergone progressive tightening and reorientation toward the flow direction, while simultaneously being refolded by F3 folds developing parallel to the vorticity axis of a non-coaxial shear. Thus, F1 through F3 folding is not a series of discrete tectonic events, but a continuum of deformation.

The consistent pattern of south-southwest trending folds overprinted by east-west trending folds, and lack of large scale sheath folds suggests that non-coaxial flow was not a simple monoclinic deformation, but rather a bulk triclinic and/or non-steady flow, that consistently favoured anticlockwise rotation of linear markers.

The implication of this model is that only those "late" folds (F3) that have recently initiated parallel to the vorticity axis, or those completely transposed "early" (F1 and F2) folds in equilibrium with the shear direction, have meaningful orientations for interpreting regional kinematics. Most folds will have an orientation intermediate between the vorticity axis and the shear direction.