

Seismic Interpretations from the Southern Quebec Appalachians Structural Front, South of Drummondville

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Southern Quebec has been subjected to intensive hydrocarbon exploration campaigns for fifty years. These programs had little success despite important discoveries along-strike in New York State. The only significant discoveries in southern Quebec were located in the carbonate slices imbricated along the structural front of the Appalachians during the Late Ordovician Taconian orogeny. These potential reservoirs are highly compartmentalised and a better understanding of the structural controls exerted on their geometry and seal properties is critical for renewal of exploration in this fold and thrust belt.

Recent industry seismic reflection data (BHP and Bow Valley surveys) provide important insights into the structural style of southern Quebec Appalachians structural front, south of Drummondville. Especially, the occurrence of thrusts propagating west of the mapped limit of the parautochthonous domain is widely documented. Major thrusts are interpreted here as having developed in a piggyback sequence. Long décollement planes dominate the structural style of the parautochthonous domain.

The study also emphasises one unique characteristic of the structural front that have long been underestimated: the superimposition of compressional onto extensional structures, that strongly controlled the stratigraphic assemblages within carbonate slices in the parautochthonous domain. The possible reactivation of inherited normal fault planes and the occurrence of relict roll-over anticlines might also have exerted some influence on the compartmentalisation and the structural characteristics of the slices.