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SIGNIFICANCE OF SMALL SCALE STRUCTURES FOR THE DEFORMATION HISTORY OF THE TACONIC MELANGE, EASTERN NEW YORK

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The Taconic melange was formed through the progressive disruption of a prograding turbidite fan complex during the overthrusting of the Taconic Allochthon in medial Ordovician times. The melange forms NNE trending belts, parallel to regional structural trends. South of Albany, NY a west to east sequence shows an increase in fold tightness and degree of disruption associated with a progressive change in fold orientations; from upright horizontal folds in bedded flysch to reclined SE plunging discontinuous folds in melange. This suggests that the melange represents zones of high strain where folds have been rotated as much as 90°, while bedding was transposed and boudinaged. The strong maximum of linear elements implies that $\lambda_1 >> \lambda_2$, and that strains were heterogeneous along strike. Reclined isoclinally folded calcite veins suggest that brittle fracture occurred prior to fold development.

The melange matrix consists of phacoidally cleaved shales whose foliation is defined by lensoid fragments of shale and siltstone. Microstructurally, this fabric consists of conjugate microshear sets in sections perpendicular to the mesoscopic fabric. Dominant east-plunging striations on the polished phacoid surfaces suggest that the NNE striking set is the most significant in offset. Microshears range from crenulations to discreet shear planes; sense of offset can be determined from flexure and offset of the primary fabric. This cleavage appears to have formed in response to flattening ($\lambda_2 > 1$) normal to the mesoscopic foliation (bisecting conjugate shears). The development of these conjugate microshear sets, rather than a slaty cleavage, may be due to high strain rates and low degree of lithification, which might favor strain weakening deformation mechanisms and localization of strains.