The Compass: Earth Science Journal of Sigma Gamma Epsilon

Volume 85 | Issue 2 Article 5

9-17-2013

2012 Sigma Gamma Epsilon Austin A. Sartin Best Poster Award

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Sigma Gamma Epsilon President Erika Elswick with Melissa Gundersen and Dr.Frederick Vollmer from SUNY New Paltz, the 2012 Austin A. Sartin Best Poster Award winners.

KINEMATIC ANALYSIS OF THE ROSENDALE THRUST FAULT, NORTHERNMOST CENTRAL APPALACHIAN FOLD-THRUST BELT, NEW YORK

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Analysis of deformation associated with the Rosendale thrust fault in the Appalachian fold-thrust belt was conducted as part of an effort to resolve the style and age of deformation within the New York recess. This study focuses on an excellent exposure of the Rosendale thrust in Rosendale, NY. The thrust is associated with the northernmost central Appalachian Valley and Ridge fold-thrust belt, which forms the 030-trending southern arm of the Kingston orocline. The northern arm is the 010-trending Hudson Valley fold-thrust belt. They have been interpreted as Alleghanian and Acadian respectively. The hanging wall of the thrust is the Silurian Shawangunk Fm, which is well exposed in the roof of an abandoned quarry where dolostone of the Rosendale Member of the Silurian Rondout Fm was mined from the footwall. The minimum stratigraphic separation is estimated as 50 m. The fault is parallel to bedding in the hanging wall and footwall, but cuts up-section along a ramp to the south. Kinematic indicators including stepped slickenfibers, Riedel shears, crescentic chatter marks, and meter scale groove lineations are well exposed in the hanging wall. The footwall contains a spaced cleavage (S1) with intensity dependent on lithology and proximity to the fault. The fault strikes 030 and dips 51 SE. The mean S1 strikes 037 and dips 88 SE, 36 degrees from the fault. The mean slip directions (declination/inclination) were determined in several ways: from fault/S1 intersections, 320/-44, from fracture traces, 304/-48, from slickenfibers, 327/-48, and from groove lineations, 294/-51. Two local sets of overprinted slickenfibers were observed near a minor splay fault. The mean of one (SSA) is 329/-42, the other (SSB) is 243/-36. A synoptic plot and M-plane analysis show that all kinematic indicators except SSB are consistent with a reverse displacement with a minor left-lateral component. SSB has a pitch of 51, indicating a right lateral component, interpreted as related to the splay fault. Overall, brittle and ductile kinematic indicators demonstrate a thrust displacement history consistent with the trend of the southern arm of the orocline. X-ray characterization and 40Ar/39Ar dating of illite from a 0.8 m gouge zone within the Rosendale thrust is underway to resolve whether the observed deformation is Acadian, Alleghanian, or a combination.