USING JAVASCRIPT TO STANDARDIZE DIGITAL PHOTOMICROGRAPHS FOR FRY STRAIN ANALYSIS; BINNEWATER SANDSTONE, CENTRAL HUDSON VALLEY, NEW YORK

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Fry strain analysis is a method for determining distortion of rock based on distances between grain centers and is most effective using computerized analysis of digital photomicrographs of thin sections. Simple JavaScript programs can automate image-preparation procedures. Use of these programs greatly reduces the time required to generate effective photos and ensures consistency in field of view, resolution, size, and color levels. JavaScript programs allow the user to embed sample identification and orientation information directly into each individual image file. Thus, the programs reduce errors arising from utilizing the numerous, nearly indistinguishable images involved in a study of low-strain rock. Since JavaScript is platform independent, it can be used with both Mac and PC strain and graphic software.

Applying JavaScript programs during a normalized Fry analysis of finite strain in a portion of the northern Appalachian fold-thrust belt emphasizes their value. Twenty-one samples of Binnewater Sandstone, a Late Silurian quartz arenite, were collected near Rosendale, New York. Three mutually perpendicular petrographic thin sections were prepared from each sample and photographed using a digital camera through a 2.5X objective and crossed polars. Image contrast was enhanced with a +530nm accessory plate to aid in computer analysis. For each image, data regarding the location of the field of view on the thin section, sample orientation, and optical parameters were recorded in a database. A JavaScript that we wrote for use with the scripting plug-in for Adobe Photoshop™ 7 automatically resizes and crops the image, corrects color levels, and embeds meta-data regarding project name and author. The script then refers to the database to inscribe the filename, sample orientation, scale bar, and a graphical representation of the field of view location on the slide on each image. The script prepares images in less than a minute apiece and saves the result in JPEG format. 250 grains from each resulting image were digitized using EllipseFit v.1.0a6 software (©1998 F.W. Vollmer) to generate Fry plots. Results of our analyses demonstrate that penetrative layer-parallel strains are small (~1-5%) within a rigid strut like the Binnewater Sandstone, even where strata are tightly folded and faulted.