Quantification of Error and Uncertainty in Materials Characterization – Extensions to FEA

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Abstract.

Serial sectioning techniques for the development of three dimensional microstructures are important to the advancement of material behavior modeling. Three dimensional microstructures provide valuable statistical information about the underlying structure and defects of a given material sample. By starting with a digital representation of a material, and simulating serial sectioning data collection, final results can be compared directly to their original source. Past techniques are extenuated to include evaluation of FEA results. Thus, providing a quantifiable comparisons of accuracy for different serial sectioning methods. This helps to account for inerrant errors of reconstructed microstructures and inform experimentalist on best methods.