ON THE REPRESENTATION OF POLYCRYSTALS: DIAGRAMS, CLUSTERING, AND CORESETS

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We are dealing with the problem from materials science of representing and analyzing polycrystalline materials and their dynamics. We introduce various techniques for converting grain maps into geometric diagrams. In particular, weight-constrained anisotropic clustering allows to compute diagram respresentations from data on the volume, center and moments of the grains which are available through tomographic measurements. Also we develop new coreset techniques for data compression, which are utilized to significantly accelerate the computations while keeping control of their accurancy. This effect is demonstrated on 3D real-world data sets.
(The talk is based on recent joint work with A. Alpers, M. Fiedler, F. Klemm.)