

Jammed Configurations of Spheres and Ellipsoids: Local Structure Analysis by Minkowski Tensors

G.E. Schroeder-Turk, F.M. Schaller, S.C. Kapfer, W. Mickel, G.W. Delaney, M. Schroeter, K. Mecke

We describe work on local structure analysis of disordered particle configurations, both spheres and ellipsoids, using morphological order metrics derived from Minkowski tensors [1] applied to the Voronoi cells. For spherical particles, we have demonstrated that local structure metrics derived from the Minkowski tensors of the Voronoi cells provide relevant real-space structure information about local sphere environments [2] that can e.g. give robust measures of the degree of local crystallinity [3] and useful measures for the degree of disorder [4]. Here we will give an overview of these methods and their advantages compared to bond orientational order parameters and discuss how these approaches generalise to non-spherical particles, using ellipsoids as a specific example [5].

- [1] Schroeder-Turk et al, *Adv. Mater.* 23, 2353 (2011)
- [2] Schroeder-Turk et al, *Europhys. Lett.* 90, 34001 (2010)
- [3] Kapfer et al, *Phys. Rev. E* 85, 030301 (2011)
- [4] Mickel et al, *J Chem Phys* 138, 044501 (2013)
- [5] Schaller et al, DOI: 10.1080/14786435.2013.834389