

Supplemental Information

- Note that the geometric mean particle diameters and standard deviations provided in Table II correspond in fact to statistical parameters incorporated into the particle size distribution provided by Shirazi et al. [1, 2] to obtain the dimensions of the grains. In our simulations, we considered sand-textured soils composed of a large fraction (denoted s_1) of sand-sized grains (particles with dimensions between 0.05 to 2.0 mm) along with a small fraction (denoted s_2) of silt-sized grains (particles with dimensions between 0.002 to 0.05 mm). In the table below, we provide the average dimensions (given in mm) of the major axes m_a and m_i that respectively define the ellipsoids used to represent the sand-sized and the silt-sized particles forming the soil samples considered in our simulations.

s_1	s_2	m_a	m_i
85%	15%	0.2362	0.0452
90%	10%	0.2526	0.0447
92.8%	7.2%	0.2656	0.0440
95%	5%	0.2824	0.0429
100%	0%	0.5614	-

References

- [1] M.A. Shirazi, L. Boersma, and J.W. Hart, “A unifying quantitative analysis of soil texture: Improvement of precision and extension of scale,” *Soil Sci. Soc. Am. J.*, vol. 52, no. 1, pp. 181–190, 1988.
- [2] B.W. Kimmel and G.V.G. Baranoski, “A novel approach for simulating light interaction with particulate materials: application to the modeling of sand spectral properties,” *Opt. Express*, vol. 15, no. 15, pp. 9755–9777, 2007.