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Colloid Straining: The Impact of Packing Heterogeneity

Understanding the straining of particulates through sediment can help predict the transport properties in the sediment. In the case of mono-dispersed spheres (all spheres having equal radii), the smallest particulate that can travel through the packing ranges in size from $(1/9-1/30)$ of the radius, R . This smallest size range is governed by the gaps between neighboring spheres. However, as packings become more heterogeneous the size of the smallest particulate that gets strained by the packing is affected by an interplay of the pore throat sizes and the gaps between neighboring spheres. In this study, the packings consist of bi-dispersed packings with spheres of radii R_1 and R_2 . Presented are the properties of packings constructed by varying the volume fractions of the spheres of radius R_1 and R_2 . The effect of changing the radius ratio (R_1/R_2) in these packings is also studied in order to more fully observe the impact of heterogeneity.

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