Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Binary Solid-Liquid Fluidized Beds in Very Narrow Tubes[1] ERICK FRANKLIN, FERNANDO CUNEZ, UNICAMP - University of Campinas — Solid-liquid fluidized beds (SLFB) are commonly found in industry, where usually different grains coexist. In polydisperse cases, segregation occurs and the layer inversion phenomenon, defined as the inversion of already segregated regions, may happen under certain conditions. In addition, if the bed is narrow (bed thickness to grain diameter of the order of 10), segregation and layer inversion are highly affected by wall effects and plug formation. In this study, we investigate the segregation of grains and mimick the layer inversion phenomenon in binary SLFB in very narrow tubes. In our setup, the tube to grain diameters were between 4 and 6, and we placed the lighter grains under the heavier ones in order to force the layer inversion. We found that the characteristic time for inversion is $t_c/20$, where t_c is a proposed time scale. We found also that the average distance traveled by individual grains from the beginning to the end of inversion is within 5 to 8 h_{mf}, where h_{mf} is the initial height of the bed.

[1]Fernando Cunez is grateful to FAPESP (grant no. 2016/18189-0) and Erick Franklin to FAPESP (Grants No. 2016/13474-9 and No. 2018/14981-7), to CNPq (Grant No. 400284/2016-2) and to FAEPEX/UNICAMP (Grants No. 2210/18 and No. 2112/19) for the financial support provided.

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Date submitted: 15 Jul 2019 Electronic form version 1.4