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S shape of a granular pile in a rotating drum NICOLAS TABERLET, University of Cambridge, PATRICK RICHARD, JOHN HINCH — The shape of a granular pile in a rotating drum is investigated. Using Discrete Elements Method simulations we show that the "S shape" obtained for high rotation speed can be accounted for by the friction on the end plates. A theoretical model which accounts for the effect of the end plates is presented and the equation of the shape of the free surface is derived. The model reveals a dimensionless number which quantifies the influence of the end plates on the shape of the pile. Finally, the scaling laws of the system are discussed and numerical results support our conclusions.

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