399c Simulation of Pneumatic Dense Phase Conveying Using the Discrete Element Method

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In industry pneumatic conveying is an integral part of moving materials e.g. from reactors to storage bins and or rail cars. The performance of plants using pneumatic conveying can be influenced by the design and performance of the transfer system. However, a new design of a system requires trails since some of the stresses in conveying are difficult to measure. In order to gain more insight into the physics of the conveying system a two phase flow model of pneumatic conveying, coupling gas and granular phase, is presented. Simulations for horizontal as well as vertical straight lines discuss the influence of system as well as particle properties on plug stability, plug length, pressure drop and frontal stress in plugs. The numerical results are compared with experiments.