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A STUDY ON WALL TO BED HEAT TRANSFER IN A CONICAL FLUIDIZED BED COMBUSTOR

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ABSTRACT In the present work flow characteristics and wall to bed heat transfer in a conical fluidized bed combustor of height 0.8 m and cone angle of 30^o were numerically analyzed and the results were compared to experimental results. A two fluid Eulerian–Eulerian model coupled with kinetic theory of granular flow (KTGF) was used to simulate heat transfer in a conical FBC. Hydrodynamic characteristics such as sand volume fraction, bed expansion, and pressure drop as well as heat transfer coefficient were compared to experimental data at different operating conditions such as superficial gas velocity, granular temperature model and different wall boundary conditions. Both heat transfer coefficient and pressure drop increase with increasing gas velocity. Using phase property model for granular temperature with slip conditions at wall achieved better agreement between experimental and numerical results in case of heat transfer coefficient.