284a Particle Injection and Mixing Experiments in an One Quarter Scale Model Bubbling Fluidized Bed

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One significant factor in the operation of a fluidized bed combustor is the manner in which coal particles disperse and mix with the bed material upon entering the bed. A thermal tracing technique was used to study the mixing characteristics in a 1/4 scale model of a pressurized bubbling fluidized bed combustor. Particles cooled by liquid nitrogen are injected into the bed in the same way that pulverized coal will be injected. An array of thermistors is mounted inside the bed. They are used to trace the path of the cooled particles as they enter the bed and mix with the other bed material. The approximate concentrations can also be determined since heat transfer from the cooled particles to the fluidizing gas is negligible during the course of the experiment. Time resolve images of the particle concentration show that the lateral motion of the injected particles is much greater than the lateral motion of an injected gas jet. The extended lateral motion is due to the substantial momentum of the injected particles.