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# Pressure wave attenuation in agas solid fluidized bed: effects of particles size, density and the electrostatic charge

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## Abstract

Simultaneously digital image analysis (DIA) and pressure fluctuation analysis (PFA) have been employed to study the pressure wave attenuation behavior in a gas-solid fluidized bed. The effects of particles size, density, and natural electrostatic charge have been investigated. It was shown that increasing of the particle density leads to an increase in the pressure amplitude but has no effect on the pressure wave attenuation trend. It was also observed that the maximum pressure amplitude is proportional to the mass loaded in the bed above the probe. Increasing the particle size and having electrostatic charge both lead to an increase in the local void fraction of the dense phase which in turn lead to a reduction in the pressure amplitude and increasing the pressure wave decay factor. Thus, the wave attenuation trend can be attributed to the local void fraction of particles in the emulsion phase.

**Keywords:** Fluidized bed; Pressure; Wave attenuation; Electrostatic.

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