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Computational Investigation of Gas-Solid Flow in High Pressure High Temperature Filter

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Abstract : This paper reports a Computational Fluid Dynamics (CFD) investigation for a high-temperature high-pressure filtration (ceramic candle filter). However, parallel flow to the filter is considered in this study. Different face (filtration) velocities are examined using the CFD code, FLUENT. Different sizes of particles are tracked through the domain to find the height at which the particles will impinge on the filter surface. Furthermore, particle distribution around the filter (or filter cake) is studied to design efficient cleaning mechanisms. Gravity effect to the particles with various inlet velocities and pressure drop are both considered. In the CFD study, it is found that the gravity influence should not be ignored if the particle sizes exceed 1 micron.

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