Analysis on Fluid Dynamics and Particle Trajectories inside the Premixed Flame Reactor

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We calculated the profiles of fluid velocity and temperature for various process conditions using FLUENT. To calculate particle trajectories inside the premixed reactor, we utilized data of temperature and velocity profiles from FLUENT. We found that the particles starting at different initial positions move inside the reactor with different particle trajectories. The movement of particles along their trajectories in the premixed flame reactor is strongly affected by the gas velocity and thermophoresis. The particle trajectory investigation is important to predict particle properties because particles following different trajectories might experience different gas temperatures in the flame reactor.