

Abstract Submitted  
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**Particle motion in a turbulent serpentine channel** XIN HUANG, PAUL DURBIN, Iowa State University — Particle motion in serpentine passage was studied using direct numerical simulation coupled with Lagrangian particle tracking. In a straight, turbulent channel, eddies are responsible for particle deposition in the near-wall region. In a serpentine channel, particle inertia may be the dominant cause of high concentration near the outer bend in the curved section. However, turbulent convection is still important. This depends on the relative magnitude of particle Stokes number and turbulent time-scale. Particles with small Stokes number form a plume that leaves the inner bend and high concentration layers near both walls in the straight section before entering the bend. The high concentration layers remain thin, reminiscent of plane channel flow. Significant deposition of heavier particles in the straight section is only found on the side extended from the outer bend. There are two plumes at the entrance of bend because of the larger particle inertial and thicker layer of high concentration. Particle deposition in the curved section is also affected by particle-wall collision and simulation results of particulate impact and erosion will be presented.

Xin Huang  
Iowa State University

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