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Shock wave attenuation by water droplets[1] VERONICA ELIASSON, University of California, San Diego, QIAN WAN, University of Southern California, RALF DEITERDING, University of Southampton — The ongoing research on shock wave attenuation is fueled by the desire to predict and avoid damage caused by shock and blast waves. For example, during an explosion in an underground mine or subway tunnel, the shock front is forced to propagate in the direction of the channel. In this work, numerical simulations using water droplets in a 2D channel are conducted to study shock wave attenuation. Four different droplet configurations (1x1, 2x2, 3x3, and 4x4) are considered, where the total volume of water is kept constant throughout all the cases. Meanwhile, the incident shock Mach number was varied from 1.1 to 1.4 with increments of 0.1. The physical motion of the water droplets, such as the center-of-mass drift and velocity, and the energy exchange between air and water are quantitatively studied. Results for center-of-mass velocity, maximum peak pressure and impulse will be presented for all different cases that were studied.

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