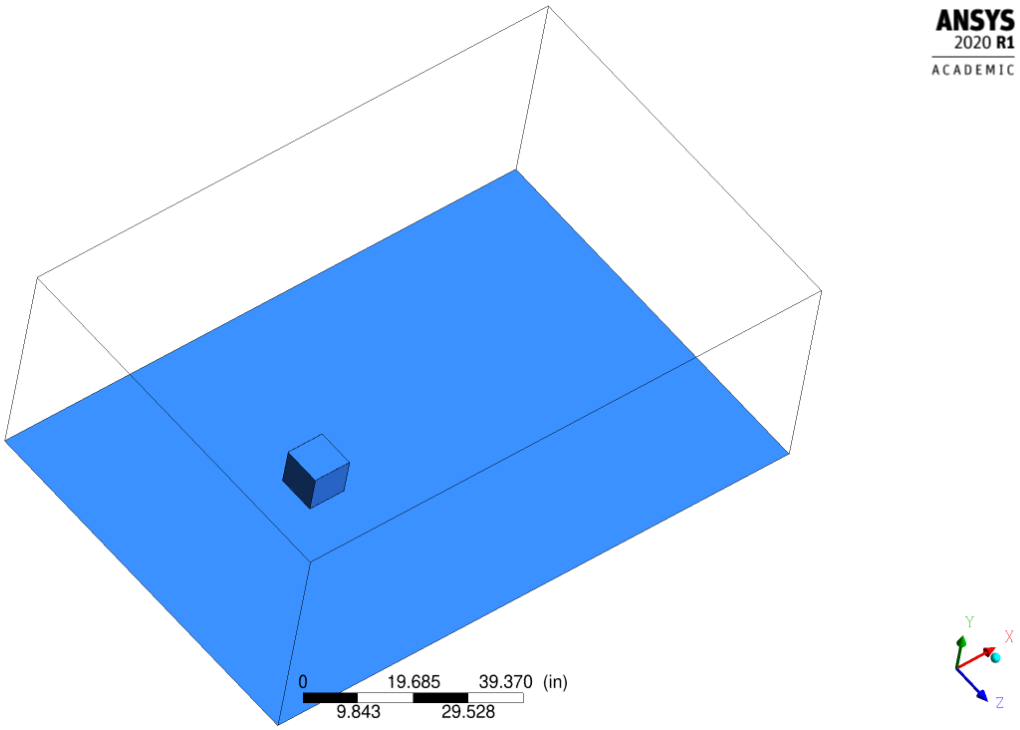

Figure 1. Computational domain and the body. The body inside the computational domain is of size 0.2x0.2x0.2m and is 0.05 m above the ground.

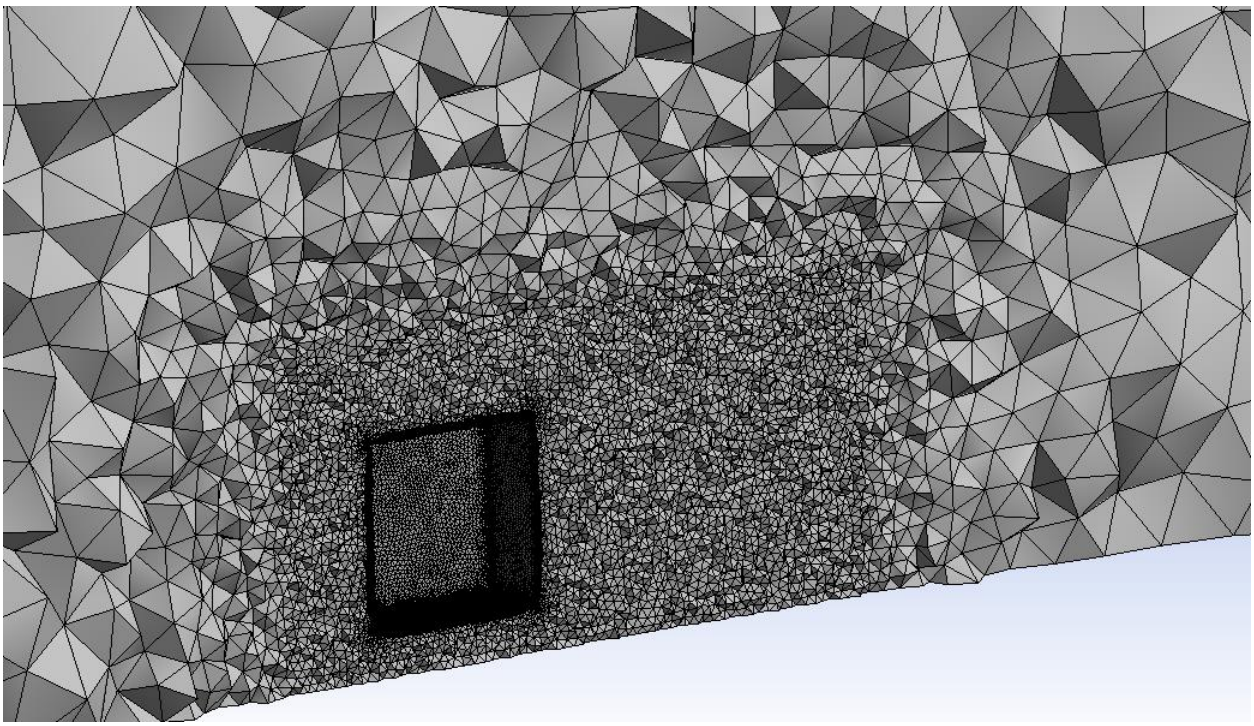

Figure 2. Mesh on a cutting plane through the body. The mesh contains approximately 0.5 million nodes and 1.85 million elements. A "body of influence" was used for refining the region around the body and the wake.

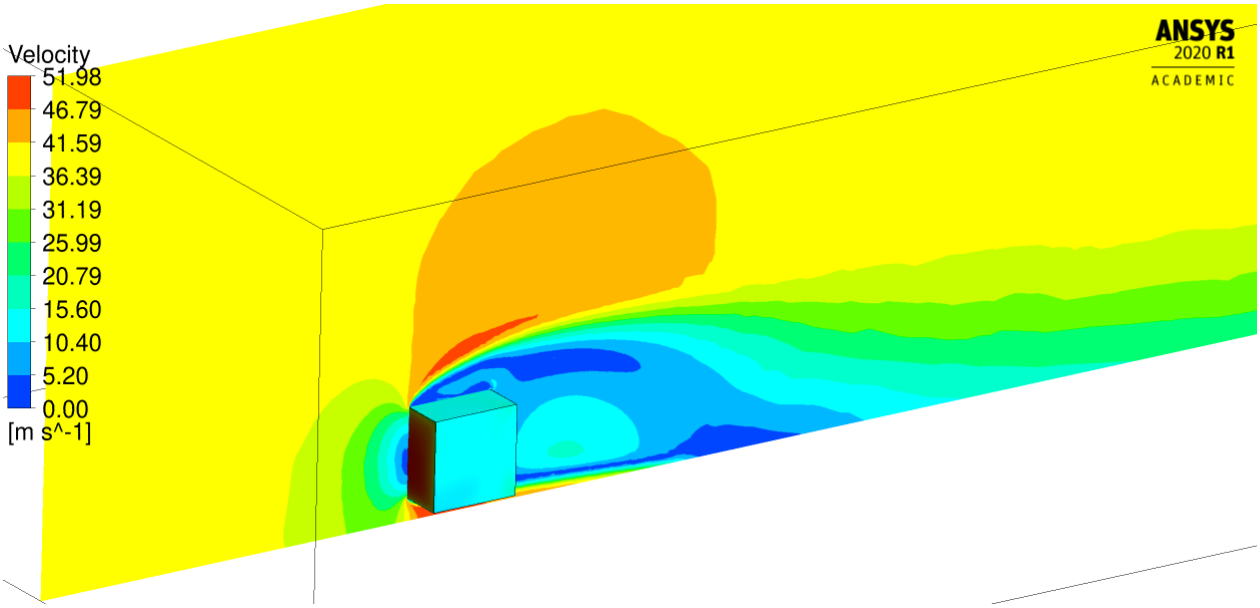

Figure 3. Velocity distribution on the cutting plane. The inlet was specified as "velocity inlet" with a velocity 40 m/s and the outlet was specified as a "pressure outlet". The ground, top, and sides were specified as slip walls.

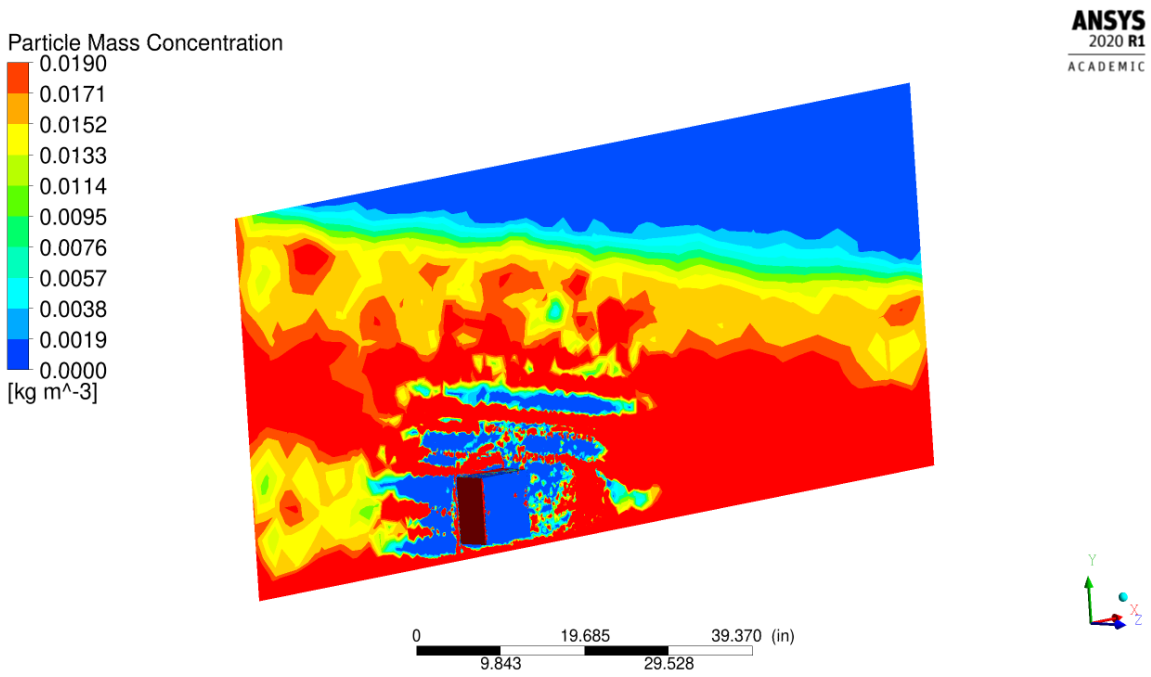

Figure 4. DPM particle concentration on the cutting plane. Intensity of the rain was taken as 19 gm/m^3 (moderate rain) and droplet sizes were assumed to vary from 1 to 3 mm. The terminal velocity of the droplets was taken as 7.9 m/s. The injector was specified at the inlet surface with a DPM particle velocity of 40 m/s along the x-direction and -7.9 m/s along the y-direction. The mass flow rate was specified based on the rain intensity. ***Issue: DPM concentration is zero at some part of the domain in front of the block, where there is a change in the mesh resolution. This is supposed to be uniform, since there is no obstructions in front of the body.***

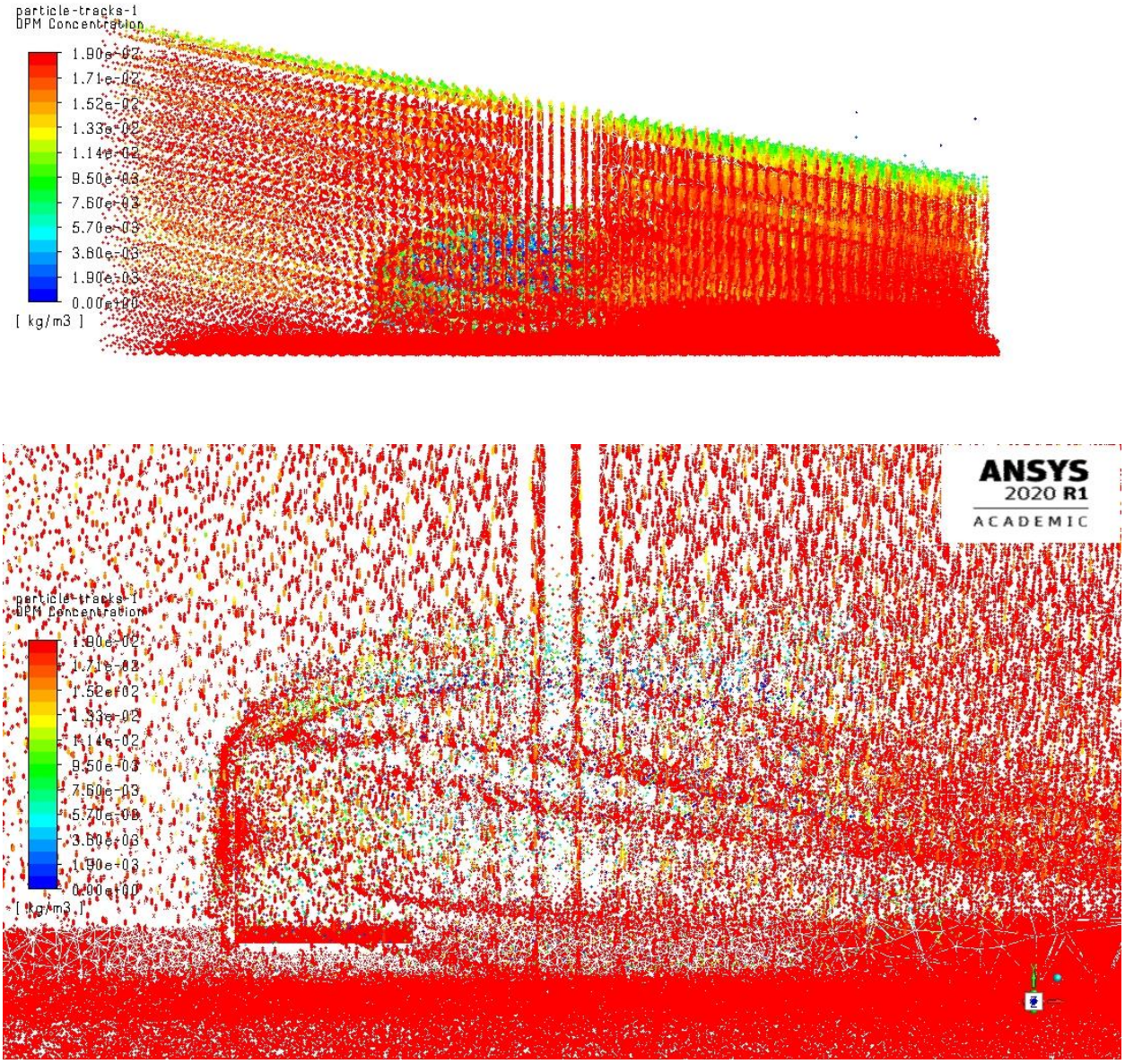

Figure 5. Particle tracks visualization from Fluent. Figures show particles are moving uniformly in front of the block and get reflected from the ground and the body. For DPM, "wall-film" boundary conditions were used for both the body and ground, and "escape" boundary conditions were used for other boundaries.

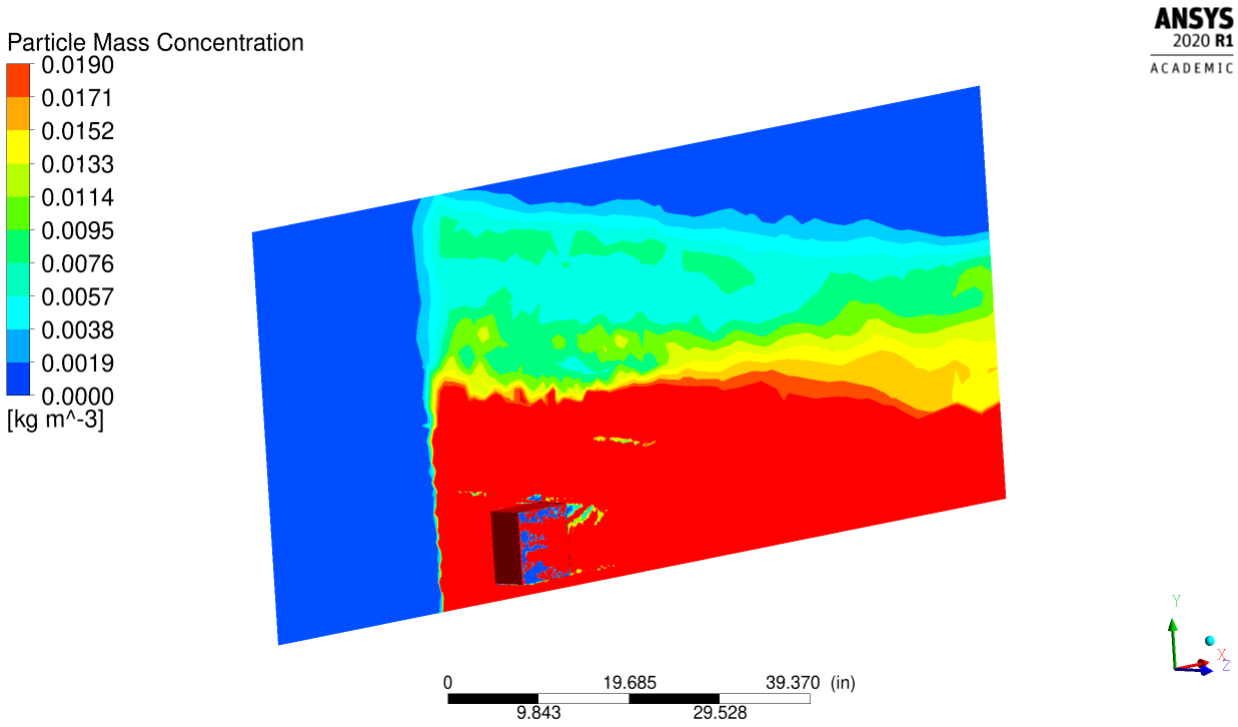

Figure 6. Particle mass concentration when the rain droplets were injected from the middle of the domain, where the refined mesh starts. All other parameters are kept the same as the injection from the inlet surface. ***Issue: Even though uniform distribution is specified for the injector, the concentration is high at the fine mesh region and low at the coarse mesh region.***