CIVE 716 EROSION AND SEDIMENTATION
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Assignment #1 Chapters 1, 2, and 3 due September 14, 2011

Problem # 1 (20%)
Solve Problem 2.3 in English units for $C_v = 0.1$.

Problem # 2 (20%)
Solve Problem 2.4.

Problem # 3 (20%)
Solve Problem 3.9.

Problem #4 (40%)
During a thunderstorm at a nominal rainfall rate of 10 mm/h, consider 1 mm spherical raindrops falling at 10 m/s. Determine the volumetric and mass concentration of raindrops in the atmosphere. Finally, consider that you are driving your car through the storm. The effective rainfall rate describes the rainfall flux on a plane surface. For instance, as you drive through the storm, you probably noticed conditions where your rear windshield can be dry while the front windshield wipers run at full speed. If you define by α the angle that the windshield makes with the horizontal. Can you define the relationship between the effective rainfall rate as a function of car speed and angle α. Derive the equations and provide a graph. Can you define dimensionless parameters describing rainfall rates and velocities for this problem. Finally, at what car speed will the effective rainfall rate be equal to zero as function of α.
