

HW#10**Assigned: Thursday, November 5, 2009****Due: Thursday, November 19, 2009**

Write the finite difference formulation for the 1-D problem. For the fracture pressure equation, use the results from HW #9. Collect terms for $\Delta_t P_i$, $\Delta_t P_{i+1}$, and $\Delta_t P_{i-1}$, with all other terms on the right-hand side (R_p). For the saturation equation, assume $P_o^{[n+1]}$ is known. Collect terms for $\Delta_t S_{w,i}$, $\Delta_t S_{w,i+\frac{1}{2}}$, $\Delta_t S_{w,i+1}$, $\Delta_t S_{w,i-\frac{1}{2}}$, and $\Delta_t S_{w,i-1}$, with all other terms on the right hand side (R_s). Please note that you will need the 2-D formulation for the term project.

- a) Write the final form of the expansion for the 1-D IMPES solution, project option 1. Feel free to use the results of previous homeworks.
- b) Write the final form of the expansion for the 1-D Partially Implicit solution, project option 2. Feel free to use the results of previous homeworks.