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HWRS482

The Challenge HW2

1. From the graph that I made, it is shown that there is a steady state, which means that the flux is also constant regardless of the change in head. This is the same for the homogenous and heterogenous graphs.

The same volume is flowing in and out of each block, i.e. steady state.

2. The energy loss is greater for small K values and the system is most sensitive where there is an energy loss, so the K_{eq} is closer to the lower values of K . The energy is the square of the gradient, so the energy loss is even greater with a low K medium.

The gradient shows that more energy is required to flow through lower K mediums. The flow is 1D because the head values change independently in all directions. I think I still need more clarification on how to tell if the system is 1D, 2D, or 3D.

3. The horizontal effective K is parallel to flow and must preserve the flux but not the head.

The K_{eq} values would be closer to the larger K value because the flow in the inclusive scenario would follow the path of least resistance, and therefore not choose the path that takes more energy. Water tries to minimize the total energy, so it will move around the lower K values. This shows the difference between the 1D and 2D systems because for the 2D system (inclusive scenario) there will be less energy expended because the water has multiple paths to choose and will choose the path that takes less energy, which is the higher K values.