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HWRS 482, HW 2

Feb 3, 2022

**The Challenge**

Chart

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The plan views of head gradients support 1D flow because of the distinctiveness of the zones. Here, qx = -K dh/dl but if we also considered qy or qz, it would not give the same dh/dl as qx alone.

Mathematically, the equivalent hydraulic conductivity (Keq) is closer to the lower K value by:

A screenshot of a computer

Description automatically generated with medium confidenceKeq = n/ ((1/Klow)+(1/Khigh)) Meaning, 1 divided by a low value is larger than 1 divided by a higher value and will have more weight.

Conceptually, these plots show how much less area the high K column occupies to maintain steady state with the rest of the system.

**#4** Graphical user interface

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The boxed area of low K greatly affects the head values in this system along the flow lines that originate in the box. This fits with the mathematical and conceptual understanding of low K impact on Keq for a 1D system. The region of low K has less impact beyond the immediate flow lines, which suggests the overall Keq would be less skewed toward the lower K than in the 2D system.

**#5**

**Glossary Questions**

1 What is MODFLOW? What is a MODFLOW package (provide at least 2 examples)? What are the inputs to a MODFLOW model?

2 What is the relationship between head gradients and hydraulic conductivity in steady state systems?

3 What is a model node? A model cell? Use a simple diagram to show the relationship between heads defined at nodes and properties defined in cells.

4 What is the difference between Type I and Type II boundary conditions and under what conditions might you use each? Provide at least 2 examples for locations where we might use Type I or Type II boundaries to represent a feature in the real world.