



What do you do with a fully tensorial 3D upscaled hydraulic conductivity model?

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In a companion paper we present a technique that is capable to upscale 3D hydraulic conductivity fields at a fine scale onto a coarse model of 3D hydraulic conductivity tensors. These tensors do not have to have their principal directions aligned with the Cartesian axes, nor they all have to have their principal directions parallel to each other. Moreover, it has been found that for best results in the upscaling process, it is better to upscale looking for the values of the blocks centered at the interfaces of the coarse model, instead of upscaling the blocks themselves and then having to do some type of averaging between neighboring blocks to define the values at the interface. The problem is then what do you do with such a model description, since there are no codes available to handle fully tensorial conductivities at the interfaces? The answer is: to write a code that handles it. This paper describes this code and shows that it outperforms MODFLOW when dealing with generic hydraulic conductivity tensors.