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An Approximate Method of Images for Finite and Non-Linear Boundaries

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The method of images is used in many different modeling scenarios such as electrostatics, fluid mechanics, and groundwater flow modeling to create infinitely long linear boundaries, such as a no-flow boundary across which flux is zero. We are using the groundwater flow arena to experiment with creating an adapted method of images to model a finite length no-flow boundaries. This is applicable to real world scenarios such as groundwater flow near impermeable bedrock. Using MATLAB, as well as our own work by hand, we are attempting to create a process that allows us to model flow near finite straight and curved boundaries. The programming is still in preliminary stages so there are not yet conclusive results, but we anticipate being able to construct both straight and curved finite no-flow boundaries.