Season Yang

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4301 Project

We are still not settle on shallow water equation or Korteweg–de Vries equation

**Project Title:** Numerical Method for KDV/Shallow water

**Project outline:**

* Research on numerical method for KDV/Shallow Water, aim to find 3-4 papers/textbooks that research on numerical schemes on the PDE.
* Settle down between Shallow Water or Kdv equation
* Do a brief literature review on the papers/textbooks and conclude a summary of the numerical schemes.
* If applicable, begin with find and implementing for exact solution for some easy test case.
* Then implement numerical method. Begin with the finite difference method, specifically explicit finite different method. Analyze the method and compare with the exact solution.
* Next try implicit method and analyze the method, compare with the exact solution.
* After we have some basic numerical schemes, depending on the papers we find, implement advanced numerical schemes, for example for the KDV equation, we can expand the equation to higher dimension or for the shallow water, do finite volume method.
* After numerical method, begin numerical analysis, compare convergence and stability analysis.