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MULTILEVEL SOLVER FOR DISCRETE PDES ON KD-TREES

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Whether tracking the eye of a storm, the leading edge of a wildfire, or the front of a chemical reaction, significant change occurs at the thin edge of an advancing line. Tracking of such change-fronts comes in myriad forms with a wide variety of applications expressible as PDEs. Expanding on Ami Hartens ideas, we construct a multiresolution coarsening method that is capable of capturing sharp gradients across different scales, and using adaptive radial basis functions, we improving on mesh-free PDE-based simulations by concentrating computational resources where the solution has rapid variation.

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