Fast sweeping WENO scheme for static Hamilton-Jacobi equations with accurate boundary treatment

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Fast sweeping WENO scheme for static Hamilton-Jacobi equations with accurate boundary treatment Chi-Wang Shu Division of Applied Mathematics Brown University In recent years, the fast sweeping method has been developed as one of the efficient techniques for obtaining the steady state solution of Hamilton-Jacobi equations. The original fast sweeping method was only designed for first order upwind monotone schemes solving convex Hamilton-Jacobi equations such as the Eikonal equation. More recently it has been generalized to high order spatial discretizations and more general types of Hamilton-Jacobi equations. In this talk we discuss our recent work in the design of a fifth order fast sweeping WENO scheme for static Hamilton-Jacobi equations with accurate boundary treatment. The boundary treatment technique provides high order accuracy near the inflow without requiring the boundary to be on grid points, thus allowing the usage of Cartesian meshes regardless of the domain boundary shape. Numerical examples will be shown to demonstrate the performance of the method. This is a joint work with Ling Huang, Tao Xiong, Mengping Zhang and Yong-Tao Zhang.