

A new resolution-enhancing technique called derivative artificial compression method is developed with multi-dimensional extension. The method is constructed via applying high-resolution difference schemes on derivative equations of conservation laws. In this way, one could overcome the defect of accuracy decay at extreme points that has plagued almost all high-resolution schemes. The new method has high resolution, low dissipation and low diffusion properties, and could enhance the resolution (of numerical solution) both at discontinuities and at extreme points. Numerical experiments are implemented using initial value problems of single conservation law, one-dimensional shock-tube problem, two-dimensional Riemann problems, double Mach reflection problem, and a shock reflection from a wedge. Resolutions of discontinuities, extremes and fine structures are compared between the original TVD scheme, TVD scheme with artificial compression method and TVD scheme with derivative artificial compression method.