# In-cell discontinuous reconstruction path-conservative methods for conservative systems in primitive variables

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## Abstract

We consider systems of conservation laws in primitive variables. Due to the use of primitive variables nonconservatives products arise. Therefore we deal with nonconservative hyperbolic systems whose conservative form is available. We are interested in the numerical approximation of discontinuous solutions for these systems. Due to the lack of control of numerical viscosity, standard path-conservative methods converge, in general, to weak solutions with wrong jump conditions in the presence of non-conservative products. The main idea of this work is to use the strategy developed in [1, 2, 3] and combine it with the good jump conditions given by the conservative form of the systems. The advantage is that the governing equations can be solved directly in the most physically relevant set of variables, the primitive variables of the nonconservative system. We will show some numerical results for the Euler multi-material system comparing path-conservative methods with and without this in-cell discontinuous reconstruction approach and the fully conservative methods. First- and second-order methods will be considered.

## References

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