



## Subgrid scale closure for the Burgers equation based on stochastic mode reduction

Stamen Dolaptchiev (1), Ilya Timofeyev (2), and Ulrich Achatz (1)

(1) Institut für Atmosphäre und Umwelt, Goethe-Universität, Frankfurt am Main, Germany

(dolaptchiev@iau.uni-frankfurt.de), (2) Department of Mathematics, University of Houston, Houston, USA

Applying a systematic stochastic mode reduction strategy [1], a local closure for the subgrid scale dynamics in the inviscid Burgers equation is constructed. Using an energy and momentum conserving finite difference discretization and introducing a fine and a coarse grid, the model variables are split into fast and slow modes. This is a different approach compared to previous studies, where the separation between the modes is done by truncation in EOF or Fourier space [2,3]. First, the closure assumptions for the stochastic mode reduction strategy are verified. Next, an effective stochastic model for the dynamics of the slow modes is presented. The model performs well in reproducing the variance and the autocorrelation function of the full model. The contributions of different terms in the subgrid scale model are analyzed. The application of the approach to the case, when forcing and dissipation are included in the Burgers equation, is discussed.

## References

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