

# Extended Self Similarity works for the Burgers equation and why

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(Submitted on 12 Dec 2009)

Extended Self-Similarity (ESS), a procedure that remarkably extends the range of scaling for structure functions in Navier--Stokes turbulence and thus allows improved determination of intermittency exponents, has never been fully explained. We show that ESS applies to Burgers turbulence at high Reynolds numbers and we give the theoretical explanation of the numerically observed improved scaling at both the infrared and ultraviolet end, in total a gain of about three quarters of a decade: there is a reduction of subdominant contributions to scaling when going from the standard structure function representation to the ESS representation. We conjecture that a similar situation holds for three-dimensional incompressible turbulence and suggest ways of capturing subdominant contributions to scaling.

Comments: 10 pages, 1 figure, submitted to J. Fluid Mech. (fasttrack)

Subjects: **Chaotic Dynamics (nlin.CD)**

Cite as: **arXiv:0912.2406v1 [nlin.CD]**

## Submission history

From: Uriel Frisch [[view email](#)]

[v1] Sat, 12 Dec 2009 09:33:37 GMT (178kb)

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