

Dispersion and collapse in stochastic velocity fields on a cylinder

Antonio Celani, Sylvain Rubenthaler (JAD), Dario Vincenzi (JAD)

(Submitted on 4 Nov 2009)

The dynamics of fluid particles on cylindrical manifolds is investigated. The velocity field is obtained by generalizing the isotropic Kraichnan ensemble, and is therefore Gaussian and decorrelated in time. The degree of compressibility is such that when the radius of the cylinder tends to infinity the fluid particles separate in an explosive way. Nevertheless, when the radius is finite the transition probability of the two-particle separation converges to an invariant measure. This behavior is due to the large-scale compressibility generated by the compactification of one dimension of the space.

Subjects: **Chaotic Dynamics (nlin.CD)**; Mathematical Physics (math-ph)

Cite as: [arXiv:0911.0915v1](#) [nlin.CD]

Submission history

From: Dario Vincenzi [[view email](#)] [via CCSD proxy]

[v1] Wed, 4 Nov 2009 19:42:15 GMT (33kb)

[Which authors of this paper are endorsers?](#)

Download:

- [PDF](#)
- [PostScript](#)
- [Other formats](#)

Current browse context:

nlin.CD

[< prev](#) | [next >](#)

[new](#) | [recent](#) | [0911](#)

Change to browse by:

[math](#)

[math-ph](#)

[nlin](#)

References & Citations

- [CiteBase](#)

Bookmark (what is this?)

[CiteULike logo](#)

[Connotea logo](#)

[BibSonomy logo](#)

[Mendeley logo](#)

[Facebook logo](#)

[del.icio.us logo](#)

[Digg logo](#)

[Reddit logo](#)