

# Partial regularity for the hyperdissipative Navier-Stokes equations

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We prove a space-time partial regularity result à la Caffarelli-Kohn-Nirenberg for suitable weak solutions of the hyperdissipative Navier-Stokes equations. More precisely we define suitable weak solutions for the hyperdissipative Navier-Stokes system

$$\begin{cases} \partial_t u + (u \cdot \nabla)u + \nabla p = -(-\Delta)^\alpha u \\ \operatorname{div} u = 0, \end{cases}$$

where  $(-\Delta)^\alpha$  is the pseudodifferential operator with Fourier symbol  $|\xi|^{2\alpha}$ , with  $\alpha \in [1, 2]$ . Then we show that, in the interesting range  $\alpha < 5/4$ , the  $(5 - 4\alpha)$ -dimensional (parabolic) Hausdorff measure of the singular set of a suitable weak solution is null. This result is obtained via an  $\varepsilon$ -regularity technique.

## References

- [1] M. Colombo and C. De Lellis and A. Massaccesi, The generalized Caffarelli-Kohn-Nirenberg Theorem for the hyperdissipative Navier-Stokes system, preprint (2017), <https://arxiv.org/abs/1712.07015>

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