

Improved Sobolev embeddings, profile decomposition, and global compactness for fractional Sobolev spaces

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We will present an improved Sobolev inequality for fractional Sobolev spaces \dot{H}^s involving Morrey norms ([2]). This refinement allows to derive an alternative, perhaps more transparent, proof of the profile decomposition in \dot{H}^s obtained by P. Gérard ([1]), using the abstract approach of dislocations spaces developed in Tintarev and Fieseler ([5]). As an application, we extend the global compactness result by M. Struwe ([4]) to any fractional Sobolev spaces $\dot{H}^s(\Omega)$, for $0 < s < N/2$ and $\Omega \subset \mathbb{R}^N$ a bounded domain with smooth boundary.

The talk is based on a series of papers in collaboration with Adriano Pisante, University Sapienza of Rome.

REFERENCES

- [1] P. GÉRARD: Description du défaut de compacité de l'injection de Sobolev. *ESAIM: Control, Optimisation and Calculus of Variations* **3** (1998), 213–233.
- [2] G. PALATUCCI, A. PISANTE: Improved Sobolev embeddings, profile decomposition, and concentration-compactness for fractional Sobolev spaces. *Calc. Var. Partial Differential Equations* **50** (2014), no. 3-4, 799–829.
- [3] G. PALATUCCI, A. PISANTE: A Global Compactness type result for Palais-Smale sequences in fractional Sobolev spaces. *Nonlinear Anal.* **117** (2015), no. 3-4, 1–7.
- [4] M. STRUWE: A global compactness result for elliptic boundary value problems involving limiting nonlinearities. *Math. Z.* **187** (1984), 511–517.
- [5] K. TINTAREV, K.-H. FIESELER: *Concentration compactness. Functional-analytic grounds and applications*. Imperial College Press, London, 2007.