

# On the sharp Hardy inequality in fractional Sobolev spaces

*Anna Chiara Zagati*

Università degli Studi di Parma

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We introduce the Hardy inequality on fractional Sobolev spaces  $W^{s,p}(\Omega)$  and we look for the sharp constant on  $\Omega \subset \mathbb{R}^N$  convex open set. Under the restriction  $sp \geq 1$ , our main tool is to construct supersolutions for the associated equation. Moreover, we observe that this method does not work for  $sp < 1$ , but we are able to overcome this limitation in the case  $p = 2$ . The results presented in this talk are obtained in collaboration with Francesca Bianchi (University of Parma), Lorenzo Brasco (University of Ferrara) and Firoj Sk (Okinawa Institute of Science and Technology).