

# Hardy-Littlewood-Sobolev inequality

## Theorem

If  $0 < \alpha < n$  and  $\frac{1}{p} - \frac{1}{q} = \frac{\alpha}{n}$ , then there exists a constant  $C$  depending only on  $n, p, q$  such that

$$\|I_\alpha f\|_q \leq C \|f\|_p$$

for all  $f \in \mathcal{S}$ .