ABSTRACT. Let $\mathrm{S}_\omega f = \int_\omega \widehat{f}(\xi) e^{ix\xi}\, d\xi$ be the Fourier projection operator to an interval ω in the real line. Rubio de Francia's Littlewood–Paley inequality (Rubio de Francia, 1985) states that for any collection of disjoint intervals Ω, we have

$$\left\| \left[\sum_{\omega \in \Omega} |\mathrm{S}_\omega f|^2 \right]^{1/2} \right\|_p \lesssim \|f\|_p, \qquad 2 \le p < \infty.$$

We survey developments related to this inequality, including the higher dimensional case, and consequences for multipliers.