Suppose that we have an abelian group G and a complex function f on it. A number of uncertainty principles in G roughly state that f and its Fourier transform $\hat{f}$ cannot both be highly concentrated. The simplest example is the inequality relating the sizes of the supports of f and $\hat{f}$ to the size of a finite group G, namely,

$$|\mathrm{supp}(f)| \cdot |\mathrm{supp}(\hat{f})| \geq |G|,$$

and, of course, it is worth mentioning the classical Heisenberg inequality for $G = \mathbb{R}$, which states that for any $a, b \in \mathbb{R}$ one has

$$\int_{\mathbb{R}} (x-a)^2 |f(x)|^2 \, dx \cdot \int_{\mathbb{R}} (\xi - b)^2 |\hat{f}(\xi)|^2 \, d\xi \geq \frac{\|f\|_2^4}{16\pi^2} \, .$$

In our paper we obtain the optimal form of the uncertainty principle in the special case of set convolution, that is in the case when f is equal to $1_A * 1_A$ for a set $A \subseteq G$.