Let $f: X \to Y$ be a set map and $\mathcal{B}$ a filter base on Y. ~~Supp~~ Then $f^{-1}\mathcal{B} := \{ f^{-1}F \mid F \in \mathcal{B} \}$ is a filter base on X provided that every elt of $\mathcal{B}$ meets fX. We call $f^{-1}\mathcal{B}$ the *inverse image filter base*. The inverse image map respects the "finer than" order on filter bases. So the ~~inverse~~ filter generated by the inverse image filter base depends only on the filter generated by $\mathcal{B}$ and not on the particular base $\mathcal{B}$.

- $f(f^{-1}\mathcal{B})$ generates a finer filter than $\mathcal{B}$ (assuming $f^{-1}\mathcal{B}$ is defined, of course)
- For a filter base $\mathcal{B}$ on X, the inverse image of $f\mathcal{B}$ is defined, and $f^{-1}(f\mathcal{B})$ ~~generates~~ generates a coarser filter than $\mathcal{B}$.

In particular: if $f: X \to Y$ is onto, then the inverse image of every filter base on Y is defined.