Proof ► Consider any list with arbitrary length n

consisting of elements of $\mathbb{F}^\infty / U$.

For each element in this

list, it takes the form of

$(v, (x_1, x_2, \ldots))$, $v \in \mathbb{F}^\infty$ and

$(x_1, x_2, \ldots) \in U$ where

finitely many m of x_i's are nonzero.

► Call m the degree of this element.

► Then every element in the span of this

list has degree at most nm.

► Thus element of $\mathbb{F}^\infty / U$ of degree $nm + 1$

is not in the span of our list.

Hence no list spans $\mathbb{F}^\infty / U$