1135-47-1829 **Meric L. Augat*** (`mlaugat@ufl.edu`). *A noncommutative Ax-Grothendieck theorem.* Preliminary report.

The Ax-Grothendieck theorem tells us that a polynomial $p : \mathbb{C}^g \to \mathbb{C}^g$ that is injective, is bijective and has a polynomial inverse.

A free map is a noncommutative function acting on tuples of matrices that respects direct sums and joint similarity. James Pascoe proved that if $p : M(\mathbb{C})^g \to M(\mathbb{C})^g$ is an injective free polynomial, then p is bijective, has a free inverse q and, for each n there is a free polynomial r_n such that $q(X) = r_n(X)$ for each $X \in M_n(\mathbb{C})^g$.

Our goal is to prove a strengthening of the free Ax-Grothendieck theorem; a free polynomial is injective if and only if it has a free polynomial inverse. Polynomial identities and degree bounds on polynomial inverses make the task more difficult than initially expected. We present results and techniques associated with proving this stronger Ax-Grothendieck theorem. (Received September 25, 2017)