1046-13-1075   **Cynthia J Woodburn*** (`cwoodbur@pittstate.edu`), Mathematics Department, Pittsburg State University, 1701 S. Broadway, Pittsburg, KS 66762. *The Local Case Sub-algorithm for Suslin's Stability Theorem.* Preliminary report.

The result from commutative algebra known as Suslin's Stability Theorem states that the subgroup of the general linear group $GL_m(R)$ (the set of all $m \times m$ invertible matrices with entries from the ring R) which is generated by the set of elementary matrices, is equal to the special linear group $SL_m(R)$, whenever R is a polynomial ring in n variables over a field and m is at least three. An algorithmic version of Suslin's Stability Theorem exists due to Park and Woodburn. A mathematical consequence is that any $3 \times 3-$ (or larger) multivariate polynomial matrix with determinant one can be written as a finite product of elementary matrices. (Recall that an elementary matrix is a matrix that differs from the identity in at most one off-diagonal entry.) A consequence to the area of multi-dimensional digital signal processing is that a filter bank can be replaced with a cascade of simpler filters significantly reducing the number of arithmetical computations which must be carried out. An improvement to the local case sub-algorithm of the Park-Woodburn algorithm will be presented. (Received September 14, 2008)