

1014-11-1745 **J. P. Buhler*** (jbuhler@san.rr.com). *Power Residue Symbol Algorithms*. Preliminary report.

We show that n -th power residue symbols in algebraic number fields can be computed in polynomial time for fixed n , following ideas of Hendrik Lenstra, Douglas Squirrel, Mario Daberkow, and others. The first step (following Lenstra's algorithm in the case $n = 2$) reduces the problem to the case of cyclotomic fields. The second step (following Douglas Squirrel) uses lattice basis reduction to reduce to computing local norm residue symbols. The third step (following ideas of Daberkow) computes local norm residue symbols using ideas from K-theory. (Received September 29, 2005)