1147-20-269 **Alexander Hulpke*** (hulpke@colostate.edu), Department of Mathematics, Colorado State University, 1874 Campus Delivery, Fort Collins, CO 80523-1874. *Calculating Indices of Arithmetic Closures and Proving Arithmeticity computationally.*

Finite index subgroups of $SL_n(Z)$ and $SP_n(Z)$ are the prototypes of arithmetic groups. For such a subgroup G, given by a generating set of matrices, we want to determine the index in the parent. If $n \geq 3$, then G must contain a congruence subgroup, thus it is enough to calculate the index modulo the level of this subgroup.

We do so in two parts: First by determining the primes dividing the level, Secondly by calculating the level as product of prime powers.Both parts rely on the structure of congruence images, which are iterated extensions of classical groups with their (Lie-)adjoint modules. By verifying the index with a coset enumeration, we can prove that such a subgroup is arithmetic.

This is joint work with Dane Flannery (Galway) and Alla Detinko (St Andrews). (Received January 15, 2019)