1048-14-197 **Marc Moreno Maza*** (moreno@csail.mit.edu), Cambrideg, MA, and **Xin Li** (xli96@csd.uwo.ca) and **Wei Pan** (wpan9@gmail.com). *Computations modulo Regular Chains.*

The computation of triangular decompositions of polynomial systems are based on two fundamental operations: polynomial GCDs modulo regular chains and regularity test modulo saturated ideals.

In this talk, we propose new algorithms for these operations, together with a theoretical study and an implementation report. Given two polynomials p and t and a regular chain T we exhibit conditions for a subresultant of p and t to be a GCD of them w.r.t. T. We deduce asymptotically fast and modular algorithms for the operations under study.

We obtain significant improvements with respect to previous work on the subject. First, we do not assume that saturated ideals are radical and we do not reduce to such cases either. Secondly our algorithms do not suffer from any notion of bad specialization, in other words, all our specializations are good. Finally, our implementation report illustrates the high efficiency of the proposed algorithms: we obtain speed-up factors of several orders of magnitude w.r.t. packages with similar specifications in Maple and Magma. (Received February 07, 2009)