1048-92-122 **Casian A Pantea*** (pantea@math.wisc.edu), 480 Lincoln Dr., Madison, WI 53706, and **James B Rawlings** and **Gheorghe Craciun**. *Solvability of QSSA in chemical kinetics.*

We show that the 100-year-old approach of classic QSSA model reduction cannot be achieved in many relevant kinetics problems. By using Galois theory, we prove that the algebraic equations cannot be solved even for simple examples involving five reactions and five species (three intermediates), with nothing more complex than bimolecular mass action kinetics. In addition, we present a realistic chemical example that cannot be reduced with the classical approach. We also show that two simple alternatives to solving the QSSA equations, including Horiuti-Temkin theory, do not achieve the requirements of model reduction. We propose a reparametrization of the QSSA system that reduces the number of parameters and, for many cases, makes the system identifiable. (Received February 03, 2009)