High-Order Quasi-Steady State Assumption for Chemistry Reduction ASHRAF IBRAHIM, SHARATH GIRIMAJI, Texas A&M University — The quasi-steady state assumption (QSSA) is one of the most physically compelling concepts used for reducing large chemical kinetic mechanisms. However, QSSA is not helpful in chemistry regimes where experiential knowledge of the kinetic set behavior is lacking. This has lead to the development of more advanced kinetics reduction schemes which, while mathematically precise, are physically less insightful than QSSA. In this work, we develop a higher-order QSSA (HO-QSSA) formulation which is mathematically precise while preserving the physical clarity of the original QSSA. The talk will present examples of chemistry reduction and demonstrate the connection between HO-QSSA and other currently used reduction schemes such as Intrinsic Low Dimensional Manifold (ILDM).

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Date submitted: 06 Aug 2010   Electronic form version 1.4