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Balázs Boros* (borosbalazs84@gmail.com). *On the existence of positive steady states for deficiency-one mass action systems with two linkage classes.* Preliminary report.

The mass action differential equation of chemical reaction networks takes the form $\dot{x}(\tau) = Y \cdot A_\kappa \cdot x(\tau)^Y$, where Y is the matrix of complexes, κ is the reaction rate coefficient function, A_κ is the Laplacian of the labelled Feinberg-Horn-Jackson graph, and x^Y is a shorthand notation for the function with monomial coordinates with the powers being the entries of Y . The existence of positive steady states of such ODE's is of interest. Clearly, the existence of a positive vector in the kernel of $Y \cdot A_\kappa$ is a *prerequisite* for the existence of a positive steady state. Based on general theorems, for several mass action systems, the existence of such a positive vector in the kernel of $Y \cdot A_\kappa$ is also *sufficient* for the existence of a positive steady state. In this talk, we will examine the sufficiency for deficiency-one mass action systems with two linkage classes. (Received August 09, 2015)