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Yanni Zeng* (ynzeng@uab.edu). *General hyperbolic-parabolic balance laws and thermal non-equilibrium flows.*

In this talk we discuss a general system of hyperbolic-parabolic balance laws in m space dimensions ($m \geq 1$). The system has rank deficient viscosity matrices and a lower order term whose Jacobian matrix is rank deficient as well. We show that the Cauchy problem with small data around a constant equilibrium state has solution global in time. The assumptions are reasonable and sufficiently general for applications to physical models. In particular, we study the gas flow with an internal non-equilibrium mode besides the translational non-equilibrium. Our general result recovers the existing results in literature on hyperbolic-parabolic conservation laws and hyperbolic balance laws, respectively, as two special cases. (Received January 16, 2016)