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**P. J. Morrison\*** ([morrison@physics.utexas.edu](mailto:morrison@physics.utexas.edu)), 2515 Speedway Stop C1600, Austin, TX 78712–106. *Metriplectic Dynamics and Reduction*.

Metriplectic dynamical systems [1-2] possess Hamiltonian and dissipative vector fields, where the dissipation obeys fundamental yet dynamical properties of thermodynamics, viz. conservation of energy and entropy production. This formalism will be reviewed and examples will be given. The notion of metriplectic reduction will be introduced [3], whereby larger systems with symmetry are reduced to metriplectic form.

[1] P. J. Morrison, “A Paradigm for Joined Hamiltonian and Dissipative Systems,” *Physica D* **18**, 410–419 (1986).

[2] A. M. Bloch, P. J. Morrison, and T. S. Ratiu, “Gradient Flows in the Normal and Kaehler Metrics and Triple Bracket Generated Metriplectic Systems,” in *Recent Trends in Dynamical Systems*, eds. A. Johann et al., Springer Proceedings in Mathematics & Statistics 35, DOI 10.1007/978-3-0348-041-6-15, (2013) pp. 371–415.

[3] M. Materassi and P. J. Morrison, “Metriplectic Torque for Rotation Control of a Rigid Body,” *Journal Cybernetics and Physics*, Accepted (2018). arXiv:1807.01168 (Received August 17, 2018)