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Daniel H Rothman* (thr@mit.edu), Lorenz Center, Department of Earth, Atmos, and Plan Sci, Massachusetts Institute of Technology, Cambridge, MA 02139. *Earth's Carbon Cycle: A Mathematical Perspective.*

The carbon cycle represents metabolism at a global scale. When viewed through a mathematical lens, observational data suggest that the cycle exhibits an underlying mathematical structure. This talk focuses on two types of emerging results: evidence of global dynamical coupling between life and the environment, and an understanding of the ways in which smaller-scale processes determine the strength of that coupling. Such insights are relevant not only to predicting future climate but also to understanding the long-term co-evolution of life and the environment. (Received September 17, 2013)