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James Madison University, Harrisonburg, VA 22807, and **Roger J. Thelwell** and **David
Becerra-Alonso**. *Reinventing the Wheel: The Chaotic Sandwheel*. Preliminary report.

The Malkus chaotic waterwheel, a tool to physically demonstrate Lorenzian dynamics, motivates the study of a chaotic sandwheel. We model the sandwheel in parallel with the waterwheel when possible, noting where methods may be extended and where no further analysis seems feasible at this point. Numerical simulations are used to compare and contrast the behavior of the sandwheel with the waterwheel. Simulations confirm that the sandwheel retains many of the elements of chaotic Lorenzian dynamics. However, bifurcation diagrams show the dramatic differences in the places where the order-chaos-order transitions occur. (Received September 22, 2011)