

Abstract Submitted
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A Descriptive Approach to the Geometric Phase MATTHEW RAVE, JEFF LAWSON, Western Carolina University — Geometric phase in a dynamical system can be visualized as the interplay between two characteristic periods of a closed orbit which go in and out of “synch.” We present several intuitive examples of such systems that are suitable for physics instruction. We then examine the details of a simple mechanical system on a torus to illustrate two specific approaches to determining the geometric phase: direct computation from the equations of motion, and the use of conservation laws. The elegance and simplicity of the latter approach can be explained by observing invariants under an action of the planar rotation group on the torus. We conclude by describing (in brief) how this approach extrapolates to the general method of reduction by symmetry.

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