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Title: Midpoint Rule as a Structure-Preserving Integrator

Abstract: Midpoint rule is an numerical integrator for differential equations. When used to simulate mechanical systems, it may reveal various structure-preserving features, such as symplecticity. The lecture will discuss the variational origin and structure-preserving properties of this integrator when calculations are carried out relative to a moving frame. Numerical simulations of skate's dynamics and rotating controlled rigid body will illustrate the theory.