

Abstract Submitted
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Spinning gas properties and applications V.I. GEYKO, N.J. FISCH,
Princeton University — In the present work, we study an ideal spinning gas in a cylinder with a smooth surface [1]. First, rotation plays a role of an additional energy storage that causes effective change of heat capacity and, hence, reduced compressibility in axial direction. This effect also yields efficiency increase of some thermal cycles, when spinning gas is used as a working body of the cycle with constrains on maximum and minimum temperatures. Second, the spinning breaks the symmetry under which partial pressures of a mixture of gases simply add proportional to the constituent number densities. Thus, remarkably, in a mixture of spinning gases, an inverse problem can be formulated such that the gas constituents can be determined through external measurements only. This work was supported by the U.S. Defense Threat Reduction Agency, the DOE under Contract No. DE-AC02-09CH11466, and by the NNSA SSAA Program through DOE Research Grant No. DE-FG52-08NA28553.

[1] V.I Geyko and N.J. Fisch, Phys. Rev. Lett. **110**, 150604 (2013).

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