

Abstract Submitted
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Design of Force Sensor Leg for a Rocket Thrust Detector DOUGLAS WOTEN, Hendrix College, TRIPP MCGEHEE¹, Hendrix College, ANNE WRIGHT², Hendrix College — A hybrid rocket is composed of a solid fuel and a separate liquid or gaseous oxidizer. These rockets may be throttled like liquid rockets, are safer than solid rockets, and are much less complex than liquid rockets. However, hybrid rockets produce thrust oscillations that are not practical for large scale use. A lab scale hybrid rocket at the University of Arkansas at Little Rock (UALR) Hybrid Rocket Facility is used to develop sensors to measure physical properties of hybrid rockets. Research is currently being conducted to design a six degree of freedom force sensor to measure the thrust and torque in all three spacial dimensions. The detector design uses six force sensor legs. Each leg utilizes strain gauges and a Wheatstone bridge to produce a voltage propotional to the force on the leg. The leg was designed using the CAD software ProEngineer and ProMechanica. Computer models of the strains on the single leg will be presented. A prototype leg was built and was tested in an INSTRON and results will be presented.

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