

Energy Storage Flywheel with Magnetic suspension (Xiaojun Li and Dustin Tingey)

The novel AMB (active magnetic bearing) supported, 100kw FESS (Flywheel energy storage systems) features a shaft-less flywheel. The system has potential application in uninterruptible power service (UPS), power grid regulation and wind/solar farms. My work includes electromechanical, electromagnetic and dynamic system modeling, control system design, assembly and experimental testing.

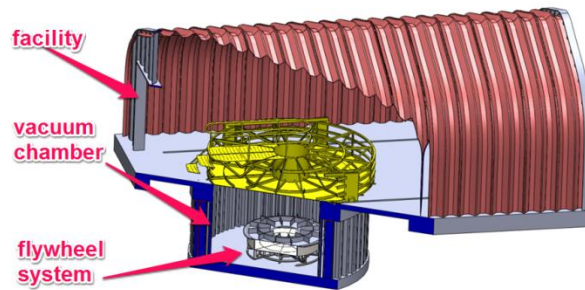


Figure 1: Cutaway view of the VCEL - Flywheel Test Facility

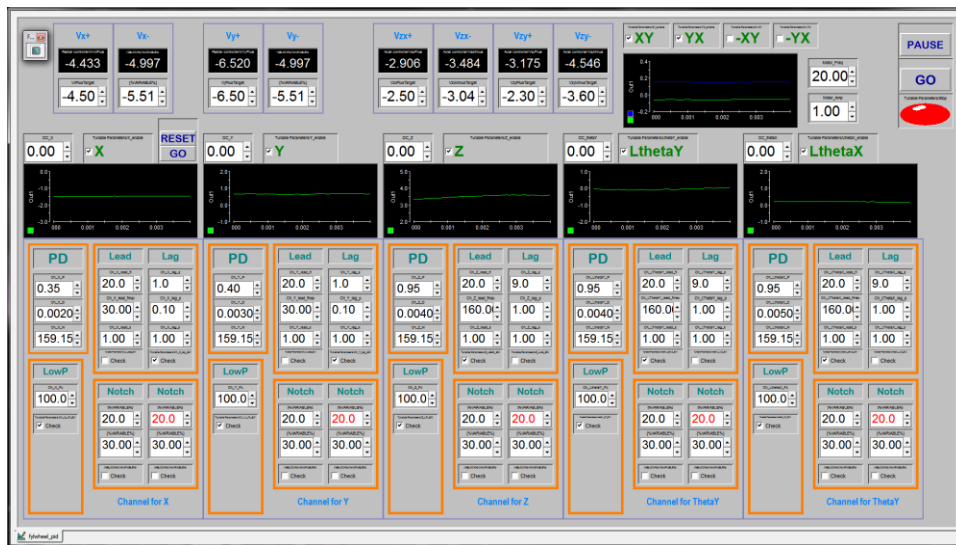


Figure 2: Real-time data acquisition and control system

100kw-Hr Flywheel and Test Facility

In conjunction with Calnetix Corp. the Vibration Control and Electromechanics Lab is presently building a 100 kw-Hr Energy Storage Flywheel ESF for the DOE. The flywheel is depicted in the drawings below and the facility is also shown. The flywheel is designed to spin at 5,000 rpm, store 100 kW-hr of energy and produce 150 kW of power. This unique steel rotor design has the potential of nearly doubling the energy density of steel flywheels. It also has a low height design, which facilitates stacking the flywheels or additional energy storage and power.

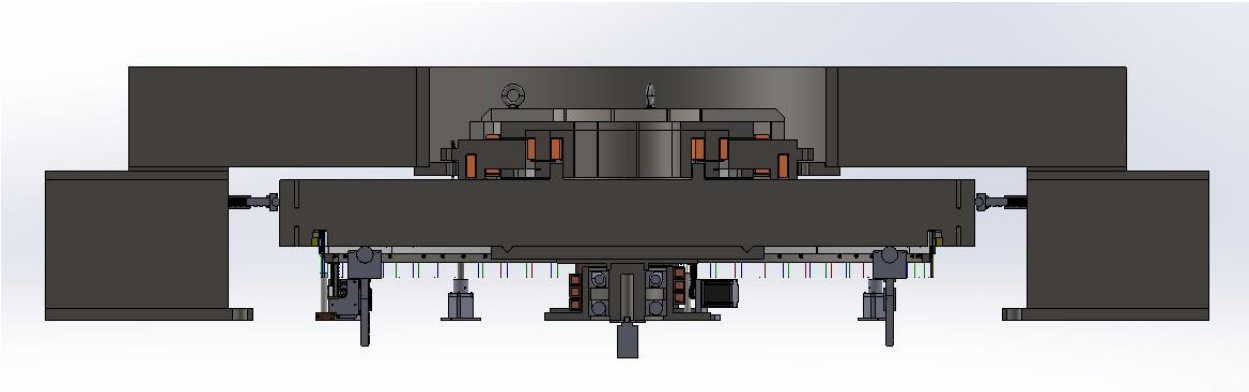


Figure 3: Flywheel Image



Figure 4: Flywheel Test Facility



Figure 5: Flywheel Test Facility