Flywheel Energy Storage for a Smart Distribution Grid

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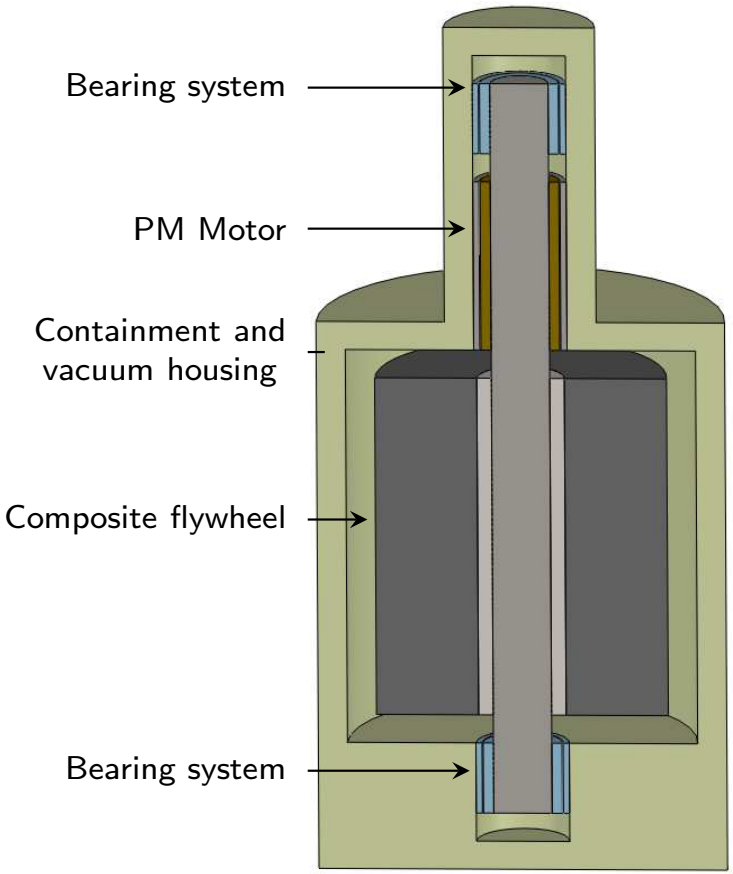
Conventional flywheel system



Traditional Flywheel Design

- 10 kRPM - 100 kRPM
- Magnetic levitation

Conventional Flywheel Technology

- High power to energy stored ratio
- Very fast response time
- Typical applications:
  - Pulsed-power
  - Power quality and UPS
  - Frequency regulation
  - More-electric vehicles
- Often compete with super capacitors
- Best designs completely self-discharge in 24 hours

Companies:

- Beacon Power LLC
- Power*THRU*
- Active Power, Inc.
- VYCON, Inc.
- Rotonix USA, Inc.
- Amber Kinetics, Inc.
- Velkess Inc.

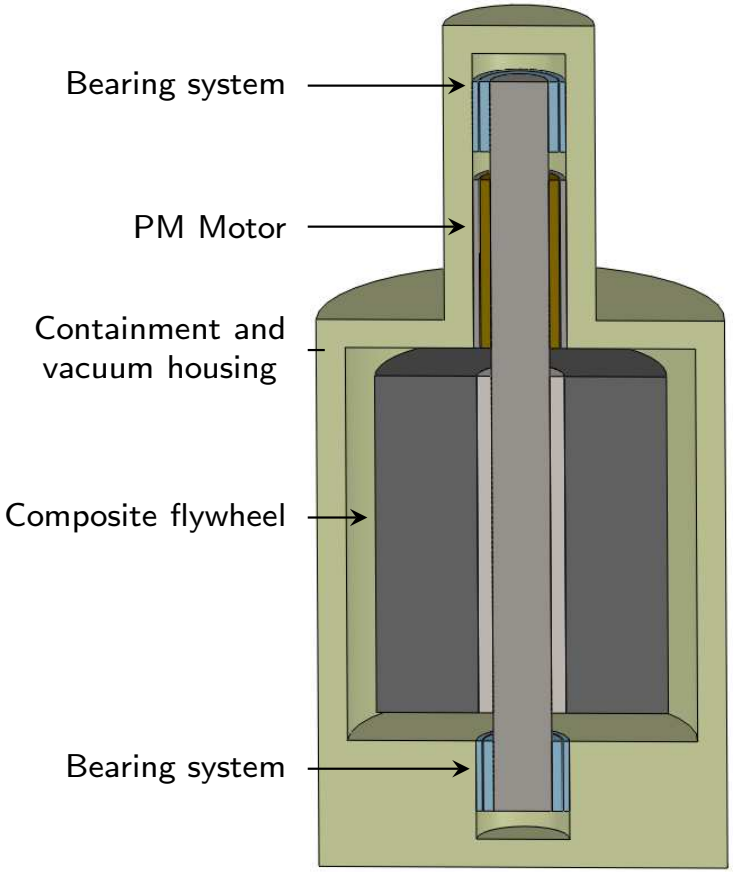
Research Focus

Goal: Simultaneously provide regulation and load-following services while being located on the distribution grid

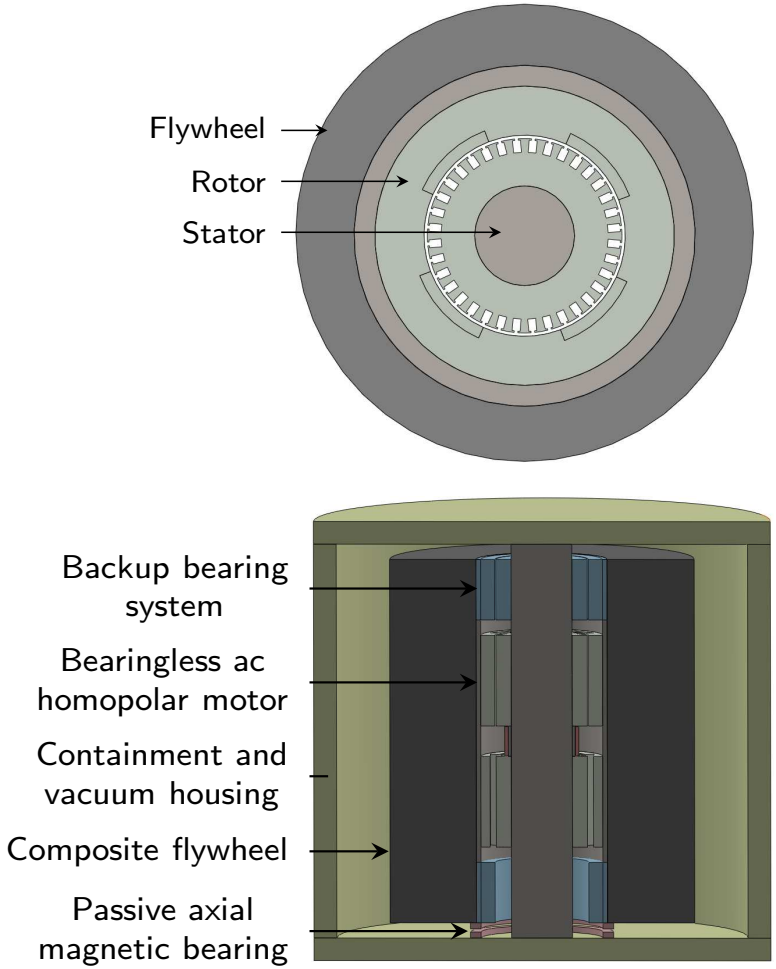
Issues to address for use as load-following energy storage

- Self-discharge
- Cost / kWh
- Energy Density

Proposed flywheel module design



Traditional Flywheel Design



Proposed Flywheel Design

Hardware prototypes

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