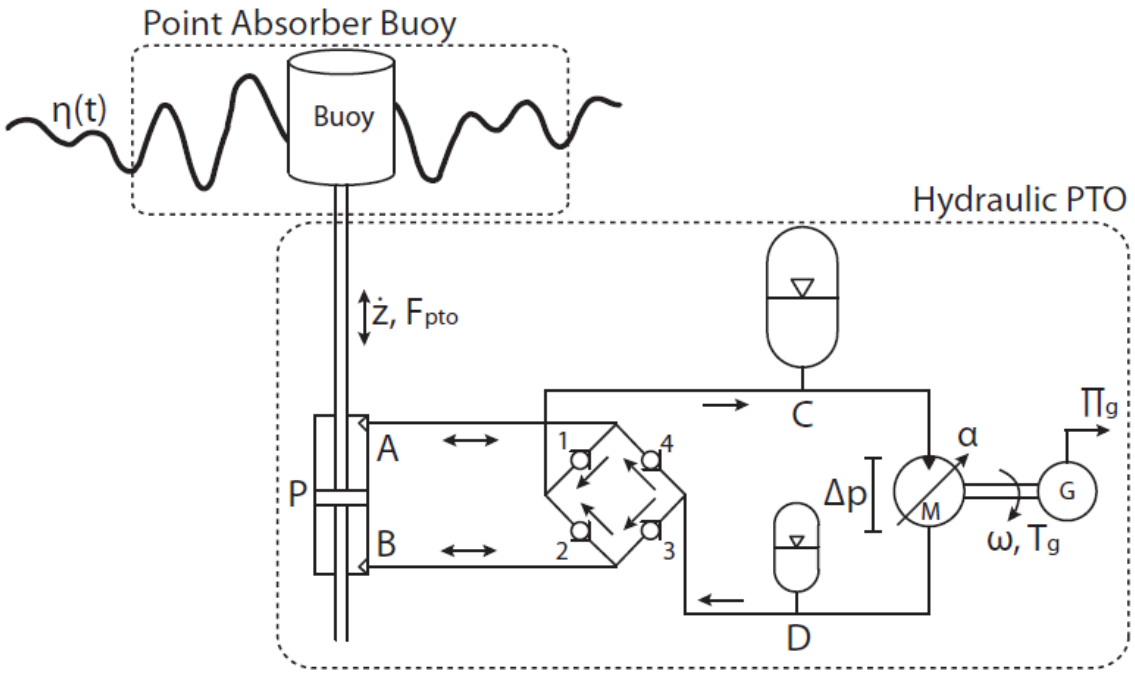
Goals for today

- This Week Updates
- Present Sean Casey's thesis:

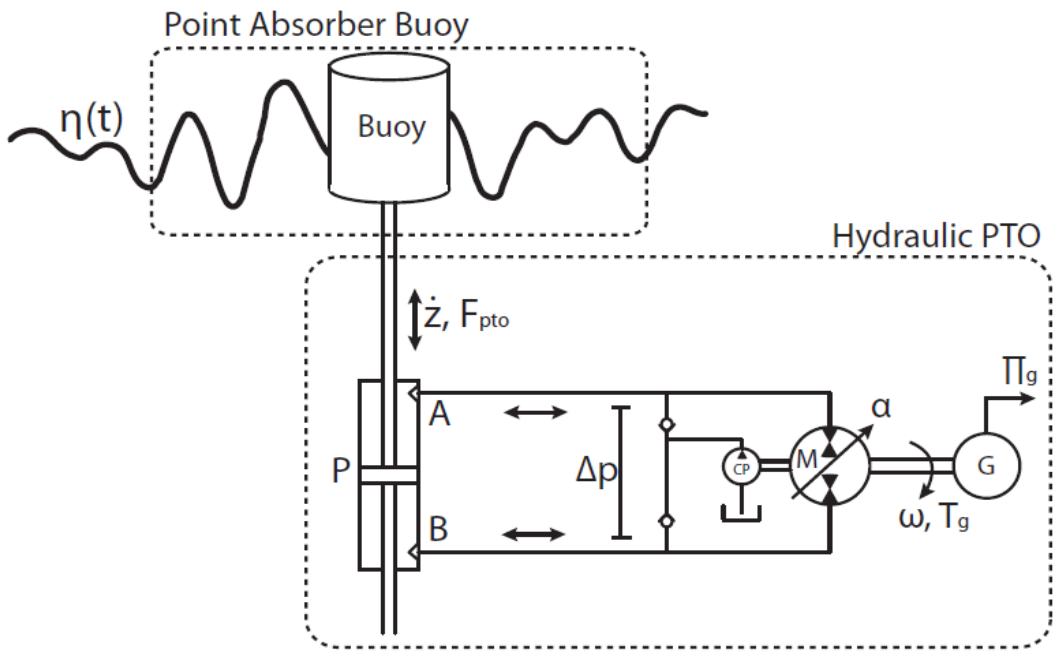
Modeling, Simulation, and Analysis of Two Hydraulic Power Take-off System for Wave Energy Conversion

- Discussion of His Models
- Next Steps

Passive Hydraulic PTO



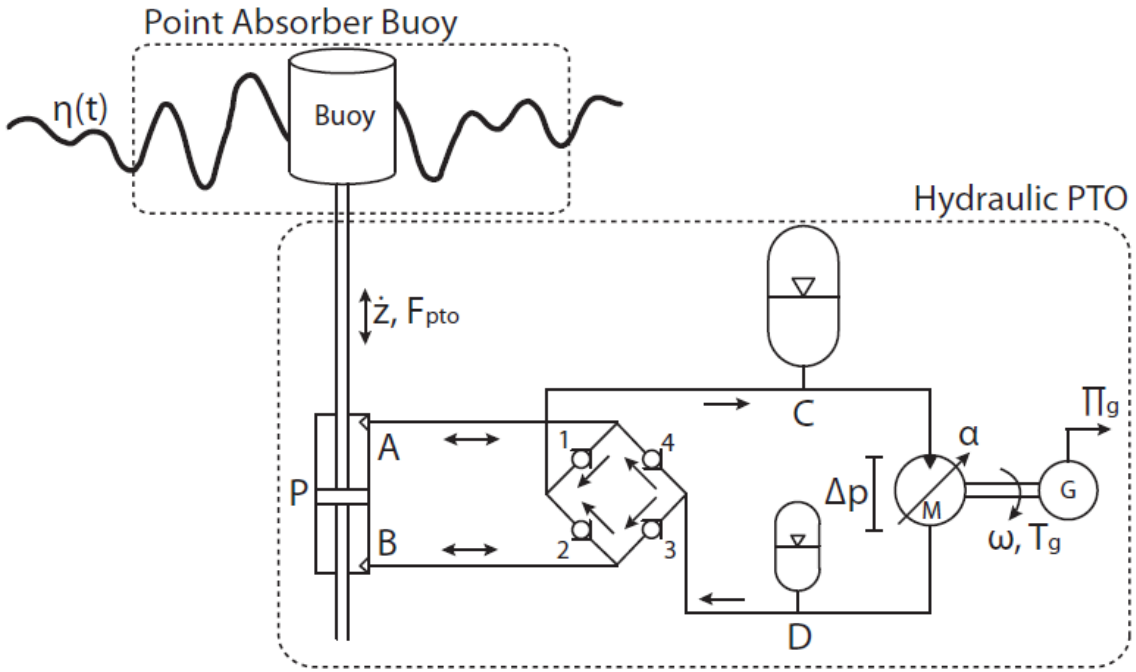
Active Hydraulic PTO



Passive Hydraulic PTO

- A double acting hydraulic piston pump
- Bidirectional flow
- HP accumulator stores hydraulic energy and smooths the flow across the motor
- A variable displacement motor
- A torque balance on the motor

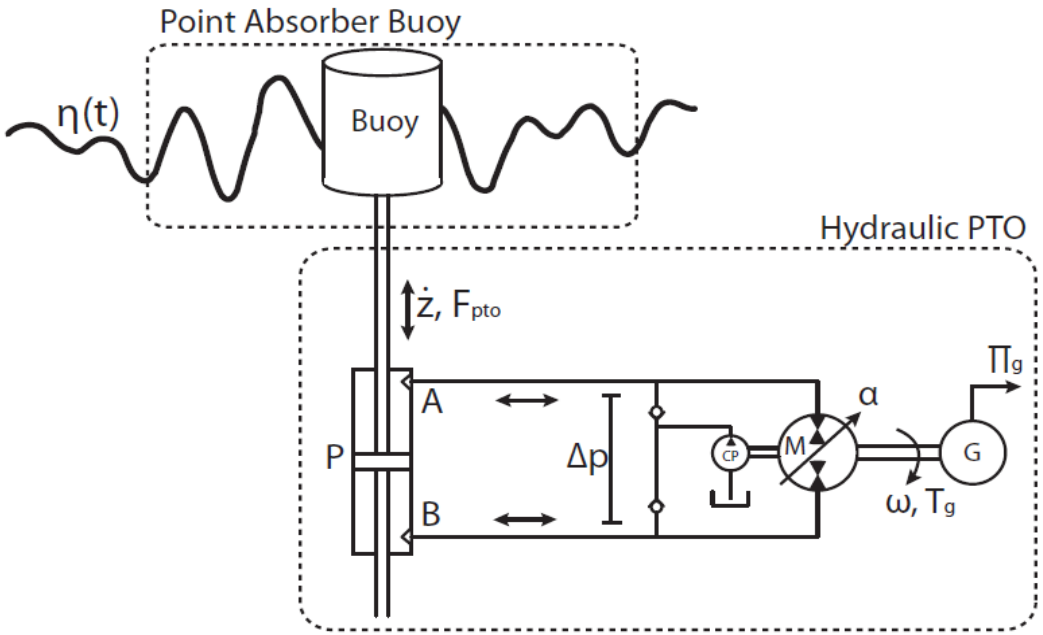
and generator



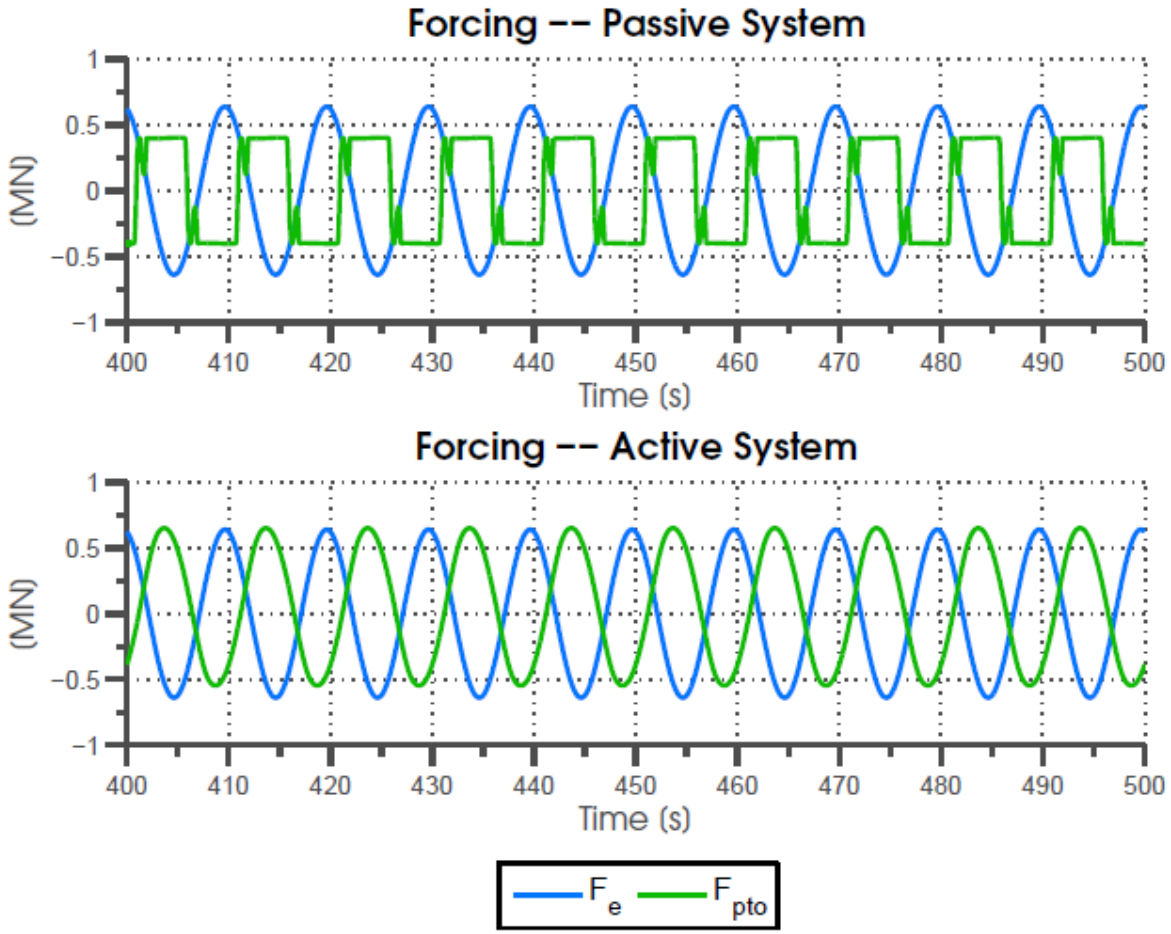
Active Hydraulic PTO

- A double acting piston directly connected to a variable displacement motor/pump
- The swashplate angle ratio can move from + to –
- A charge pump provides replenishing flow to the lines
- One of the lines is assumed to be at

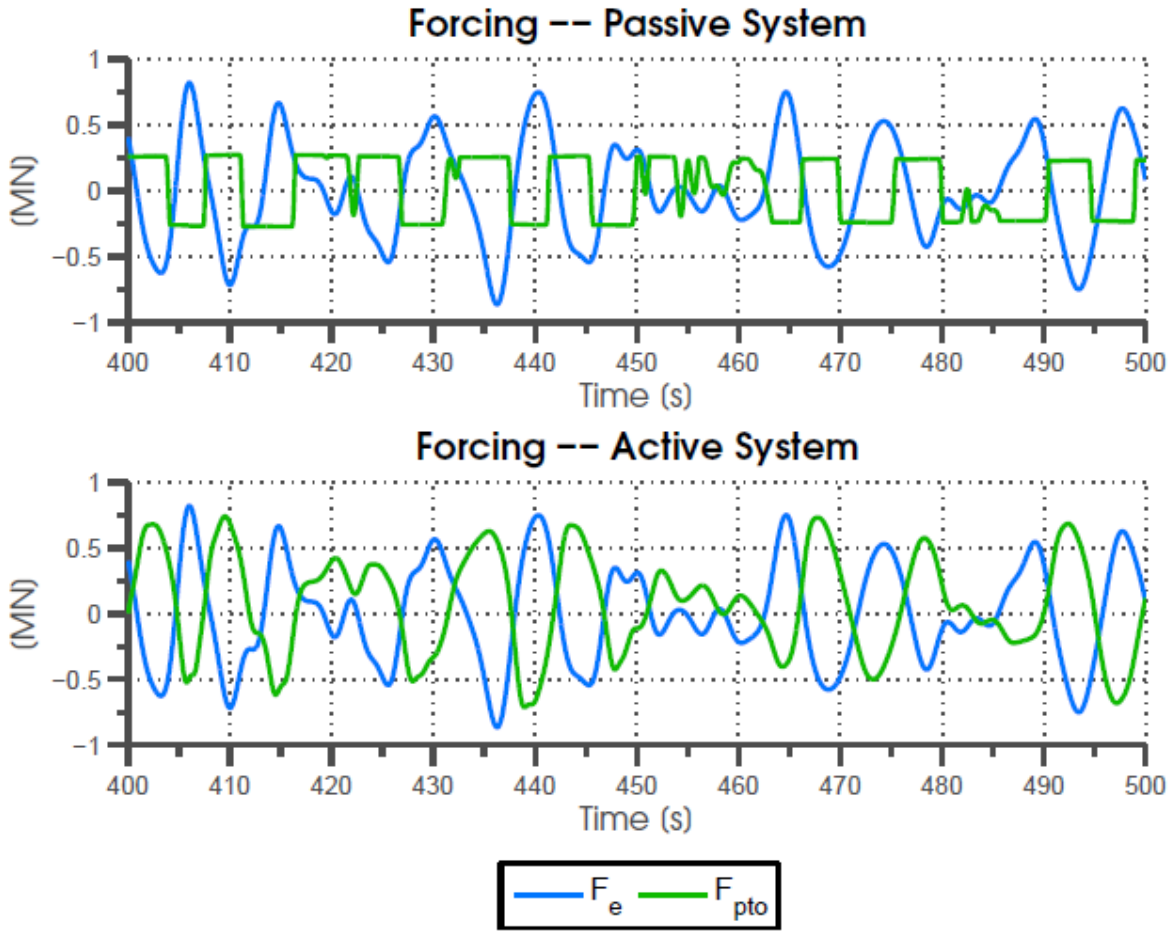
the charge pump pressure while the other line is pressurized



Excitation and Piston Forcing in Regular and Irregular Waves

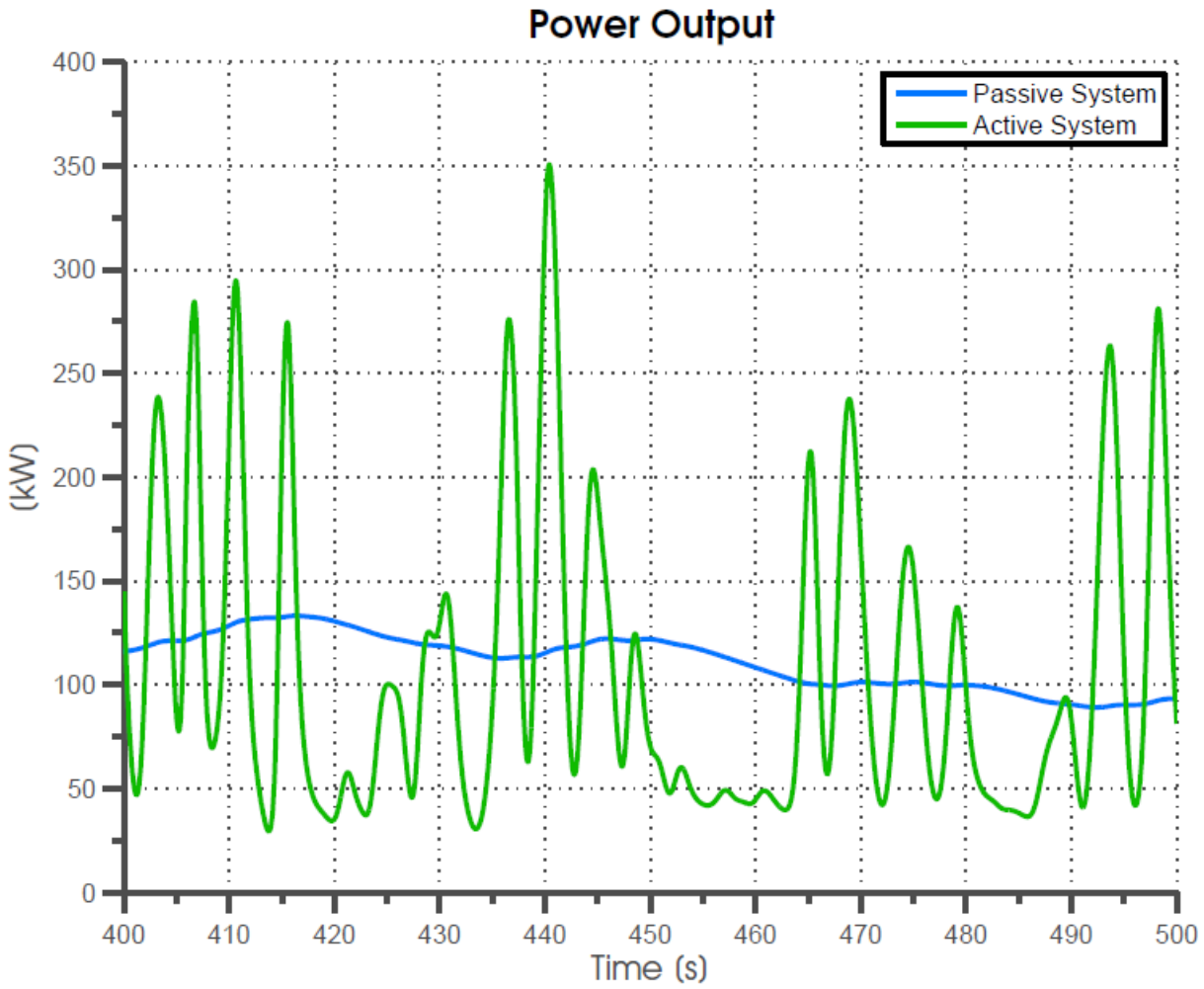


(a) Regular Waves

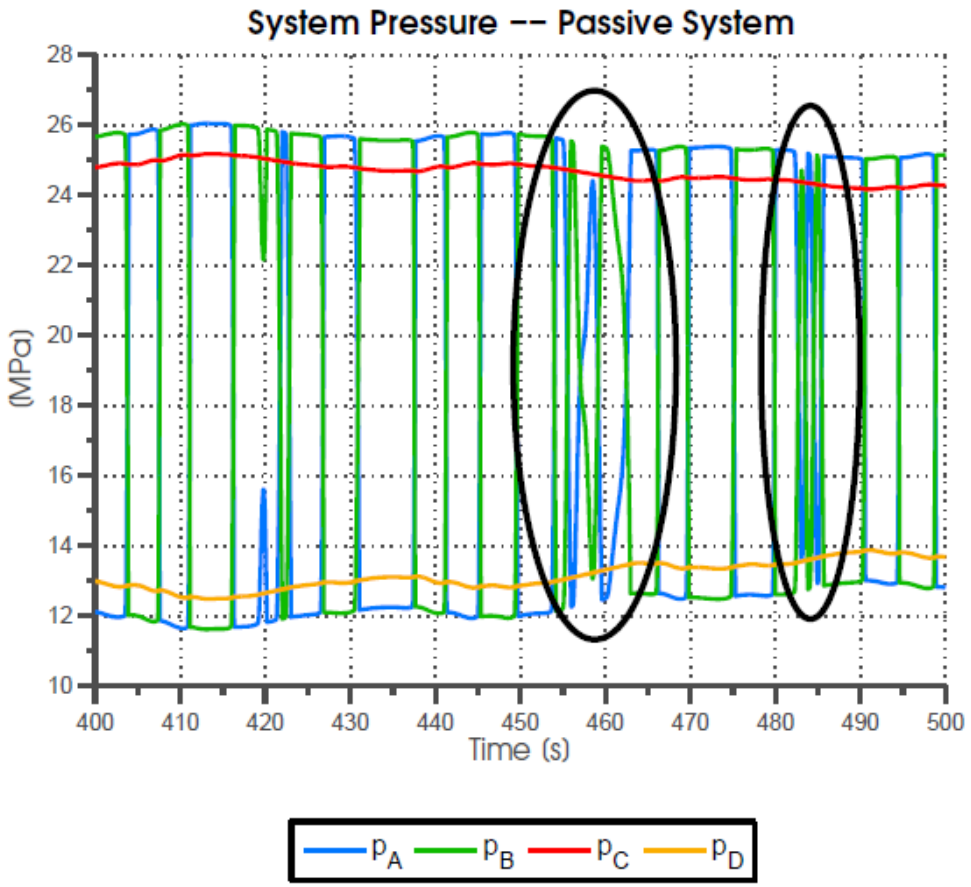


(b) Irregular Waves

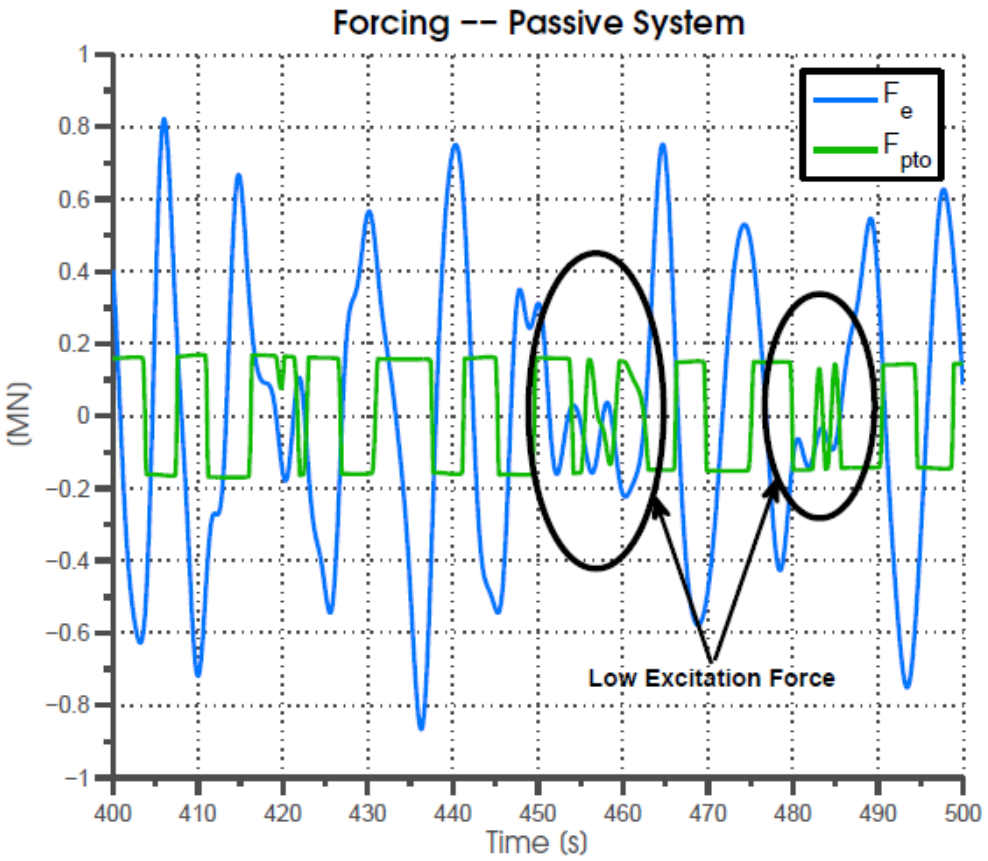
Power Output For The Passive and Active Hydraulic PTO Systems



System Pressure and Forcing

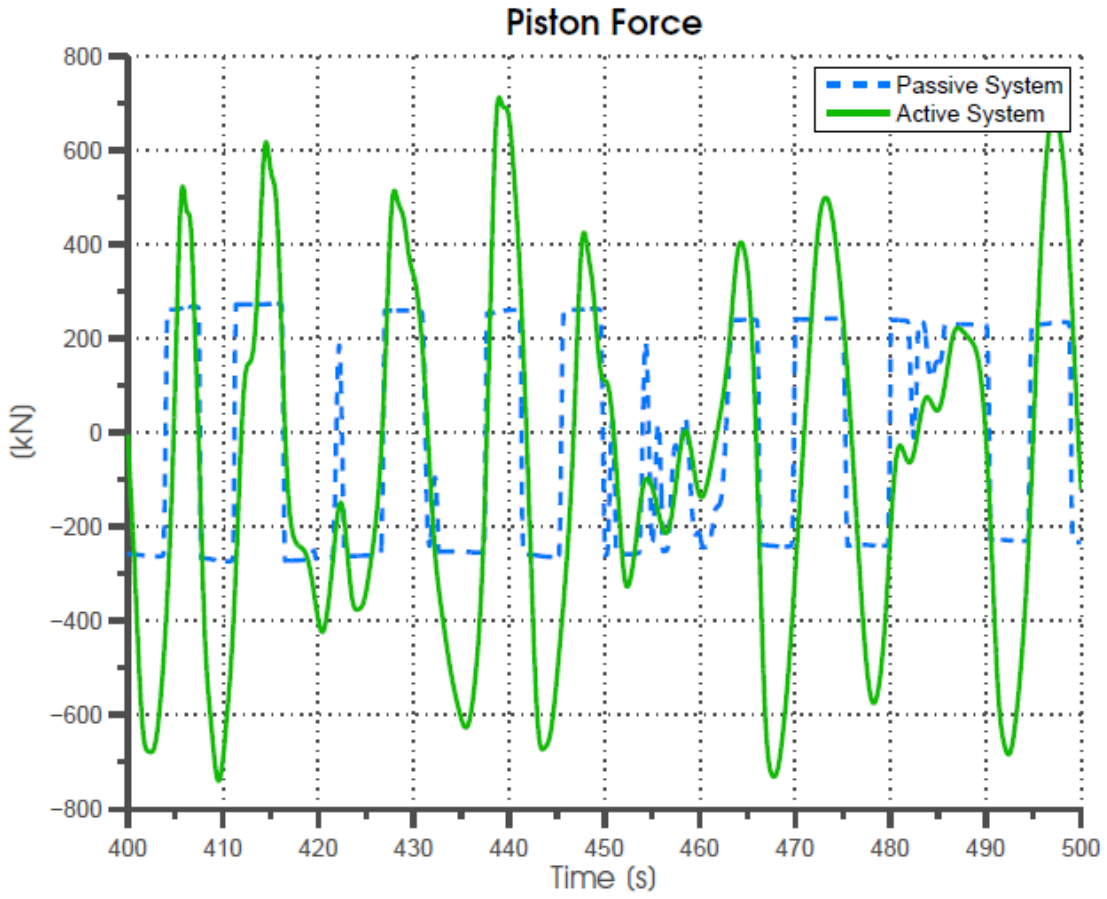


(a) Hydraulic Pressure

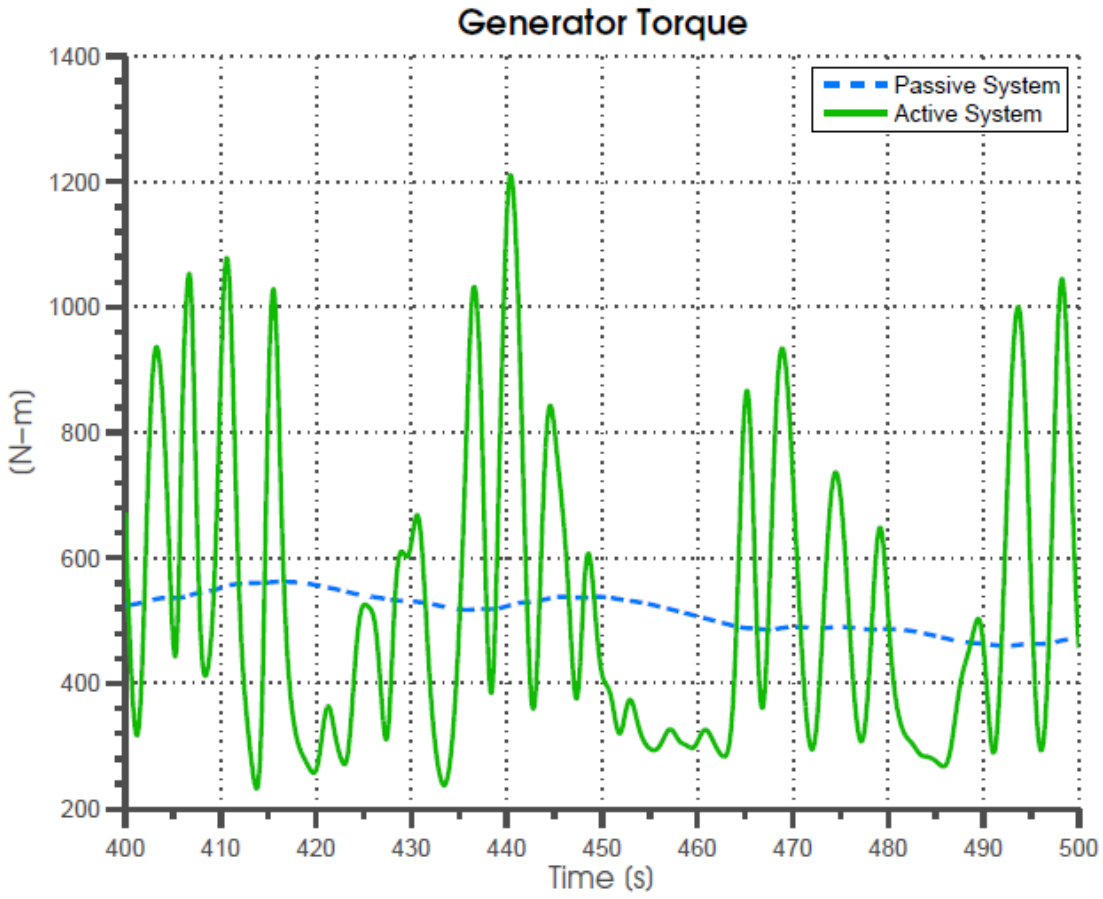


(b) Forcing

Piston Force and Generator Torque



(a) Piston Force



(b) Generator Torque