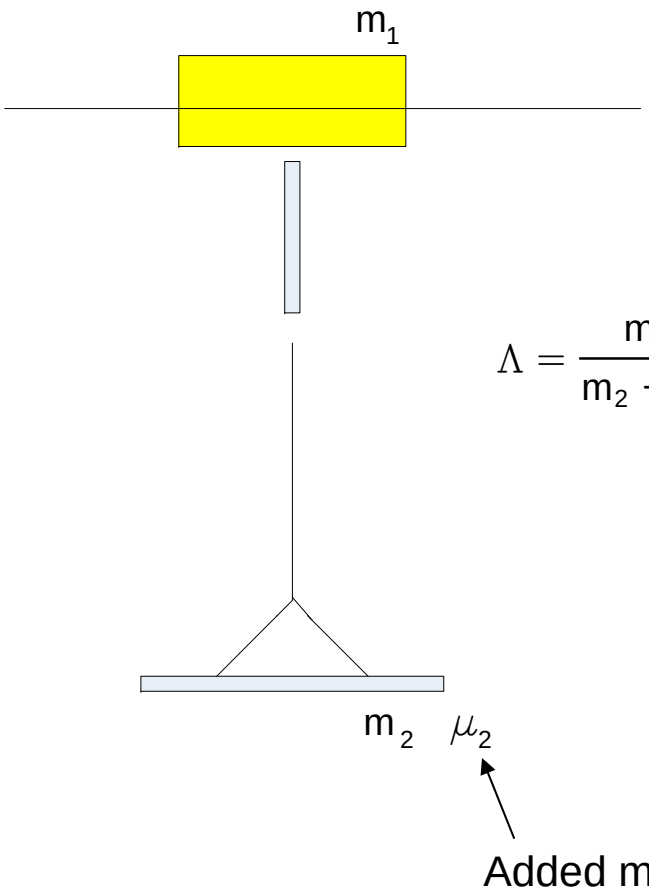
Portuguese Group

Portuguese group (Henriques, Lopes, Falcao, Gatos) is under contract to do two things:

1) Model the RASP system to determine if it will benefit from latching control. (March 5th)

2) Recommend a latching control algorithm if appropriate (March 25th)

Latching in Two-Body Systems



$$\Lambda = \frac{m_1}{m_2 + \mu_2}$$

RASP System
(as currently configured)

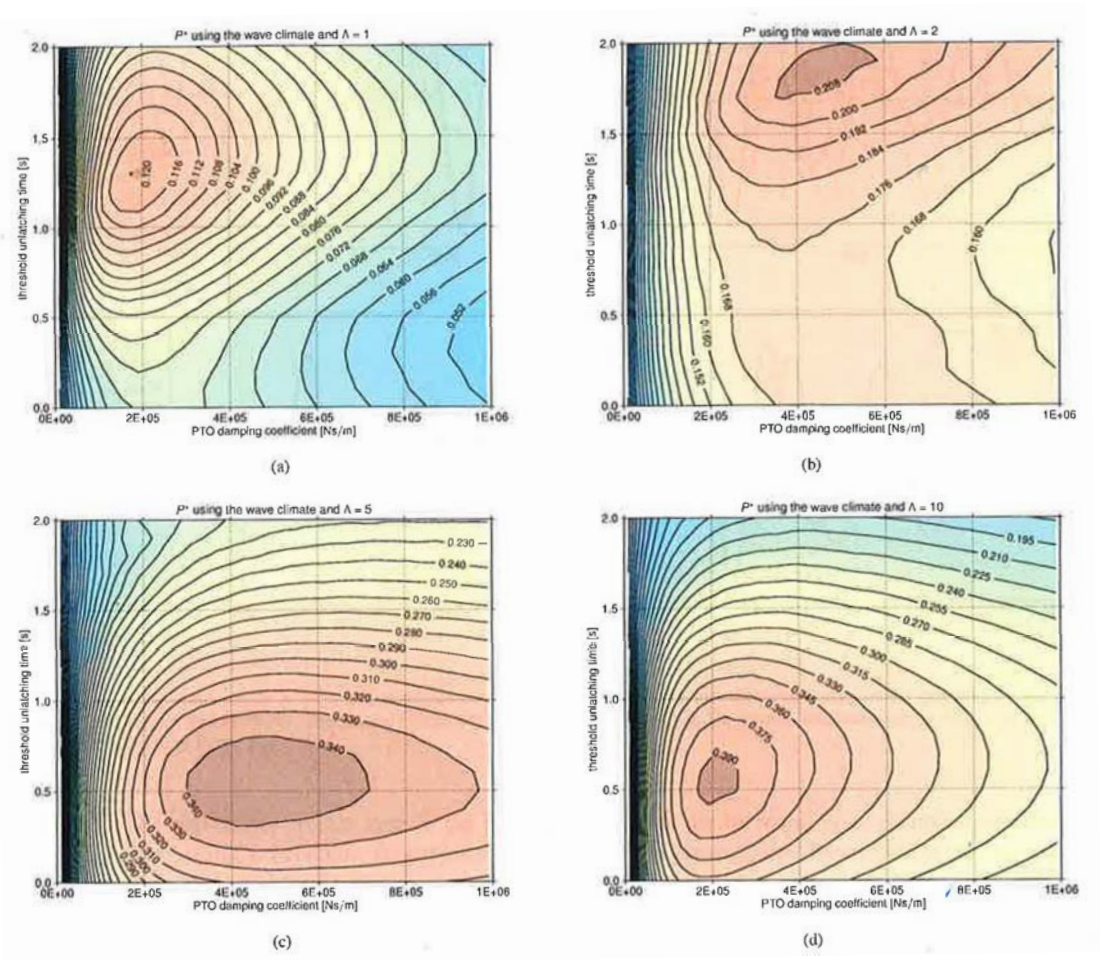
m_1 = 2000 kg
m_2 = 1000 kg
μ_2 = 9000 kg (up to 30000kg)

From WAMIT

$\Lambda = 5$ (up to 15)

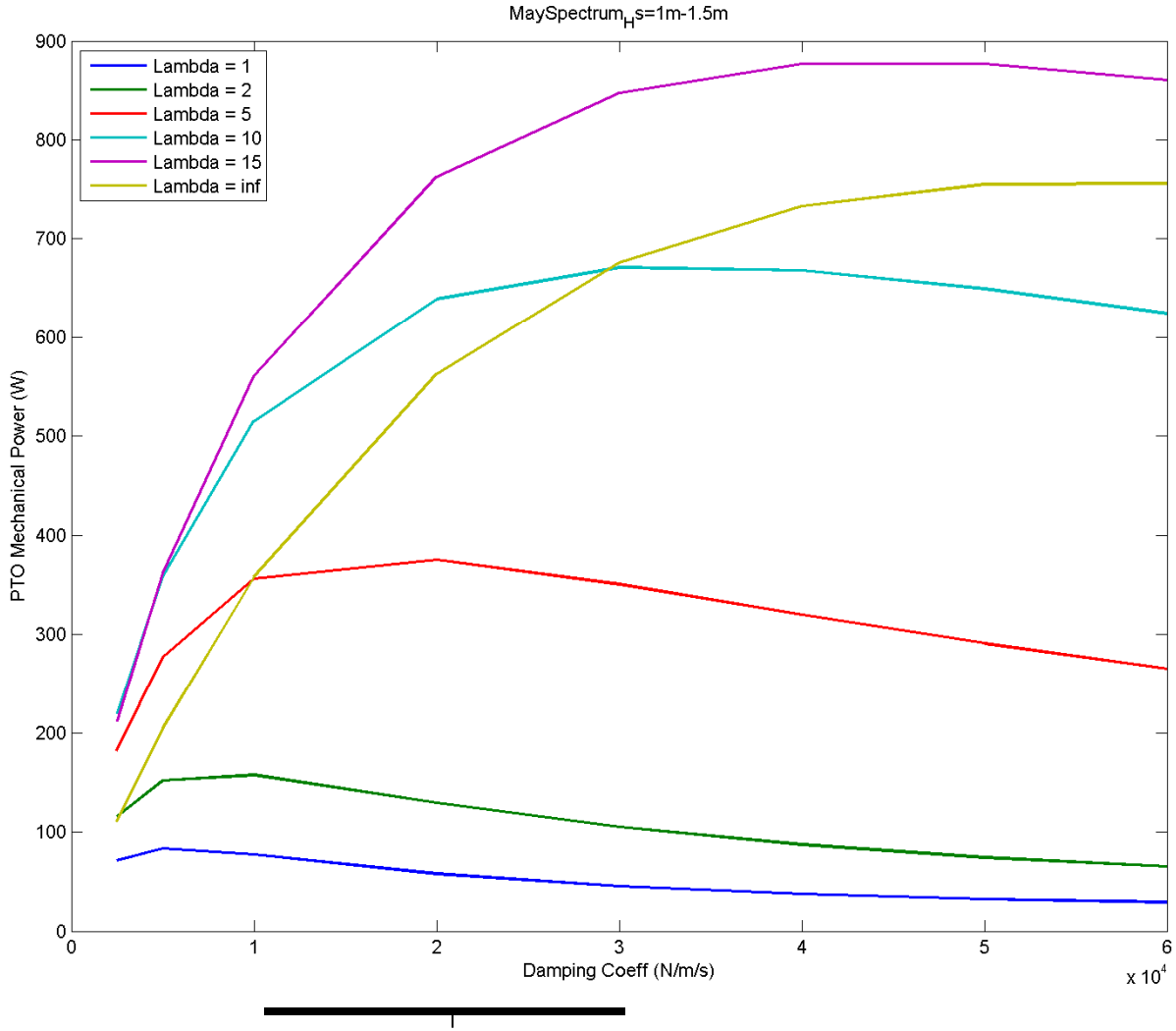
Sensitivity to Lambda

Λ = 5 →



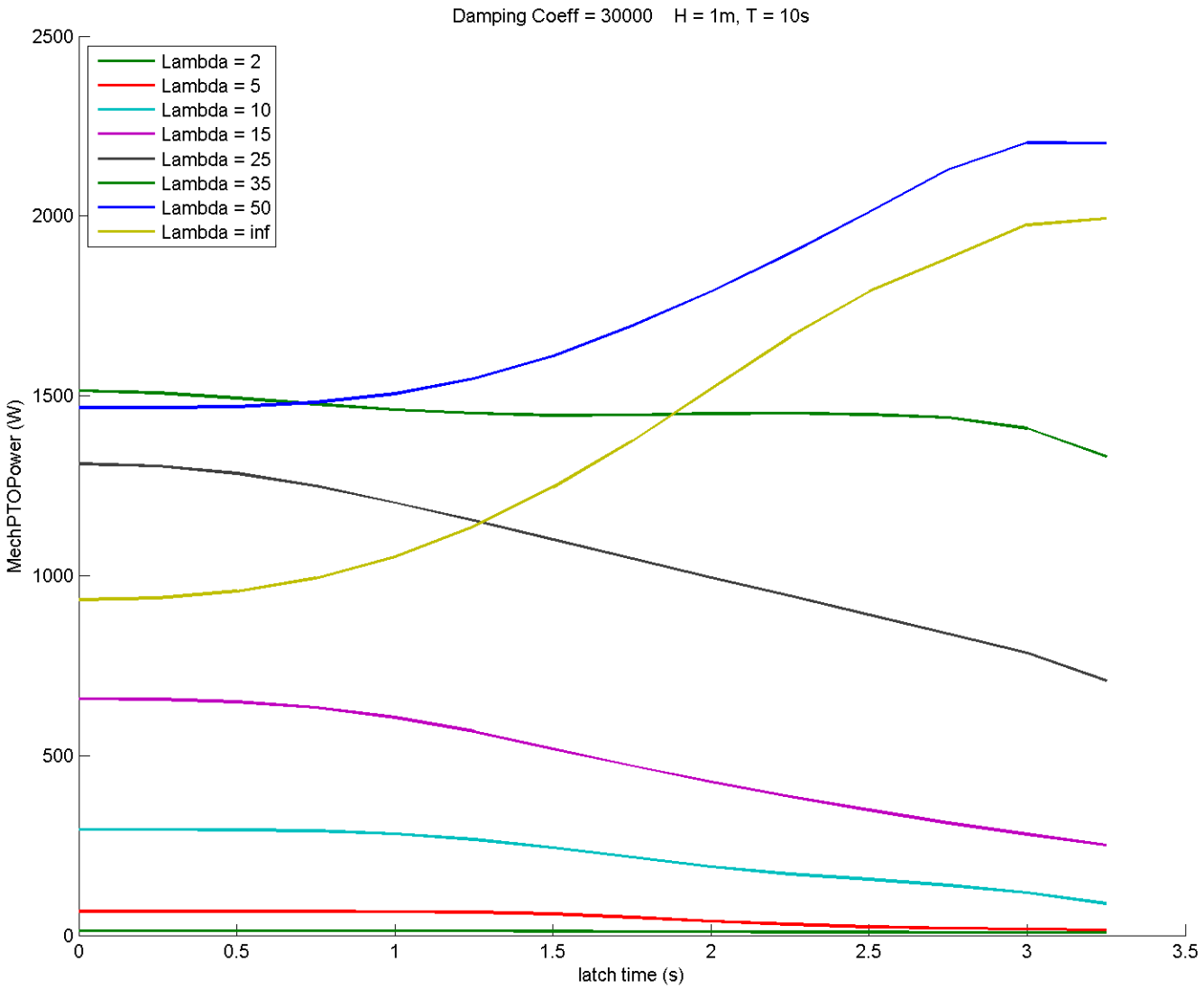
Henriques & Lopes find Λ = 5 optimum for 5m diameter buoy.

Effects of Λ on expected power (no latching)



Range of Peak PTO Eff

Effects of Latching on expected power



Unconfirmed conclusion

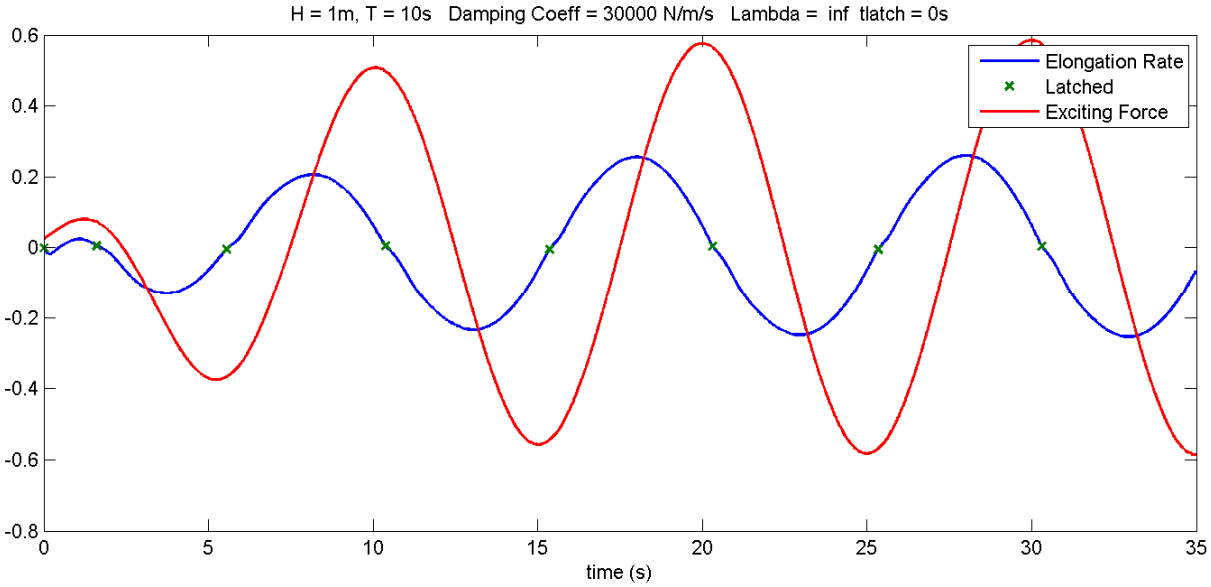
- Latching control is not going to be effective at the inertia ratios achievable in the RASP scale system

- Increasing the submerged plate added mass appears to have a strong influence on the captured power. Some survivability risks in larger seas

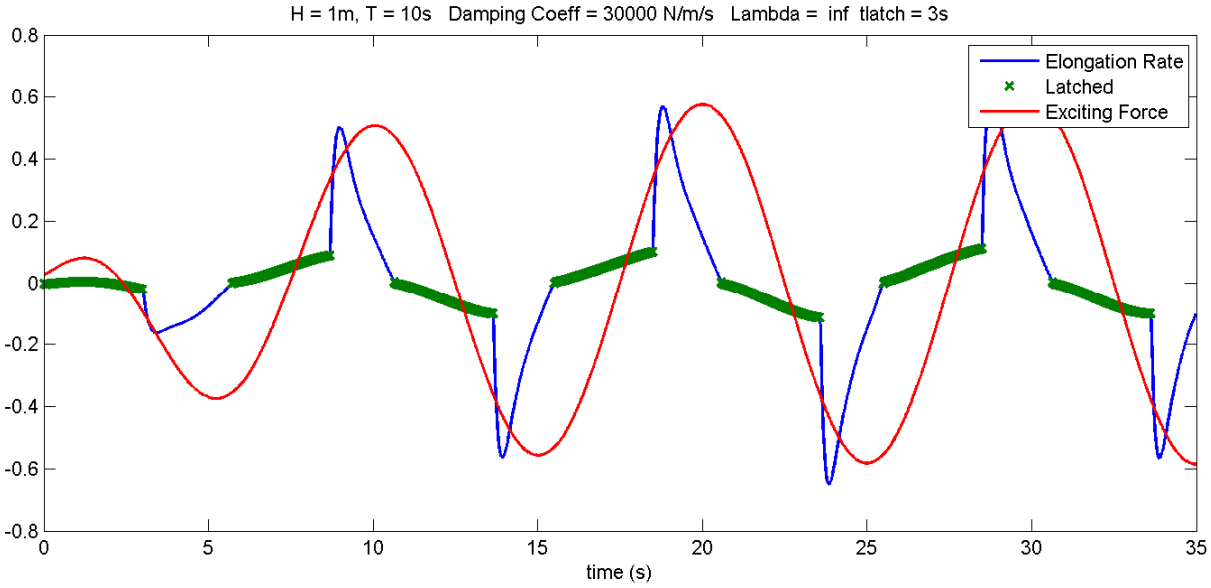
Confirmation Pending

- The Portuguese group is performing a similar analysis in parallel and will have results March 5th.

Effects of latching at very large Λ

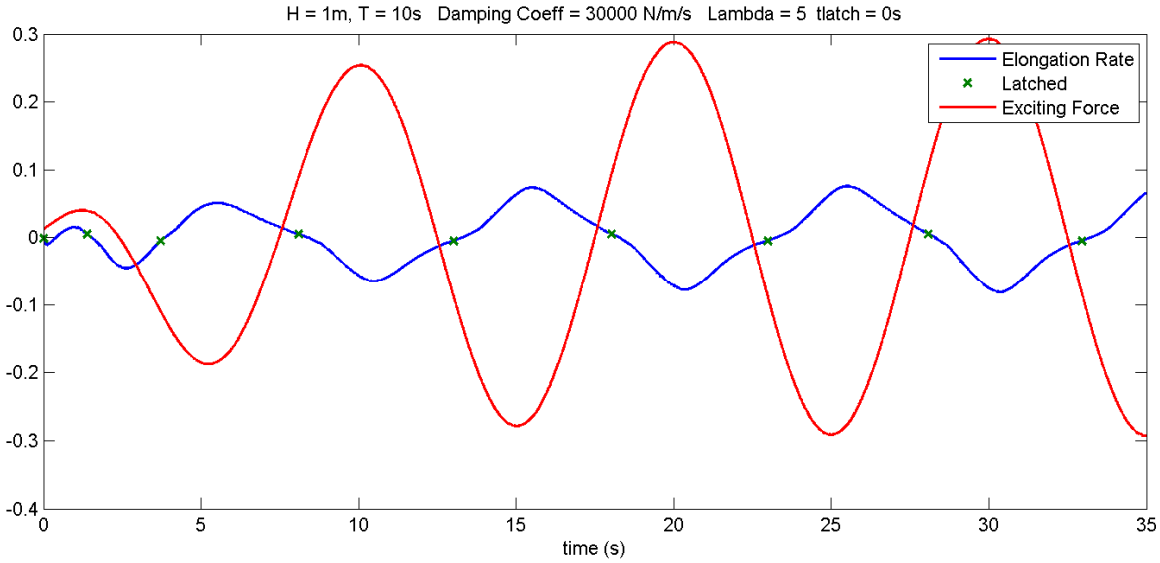


Pavg = 530 W

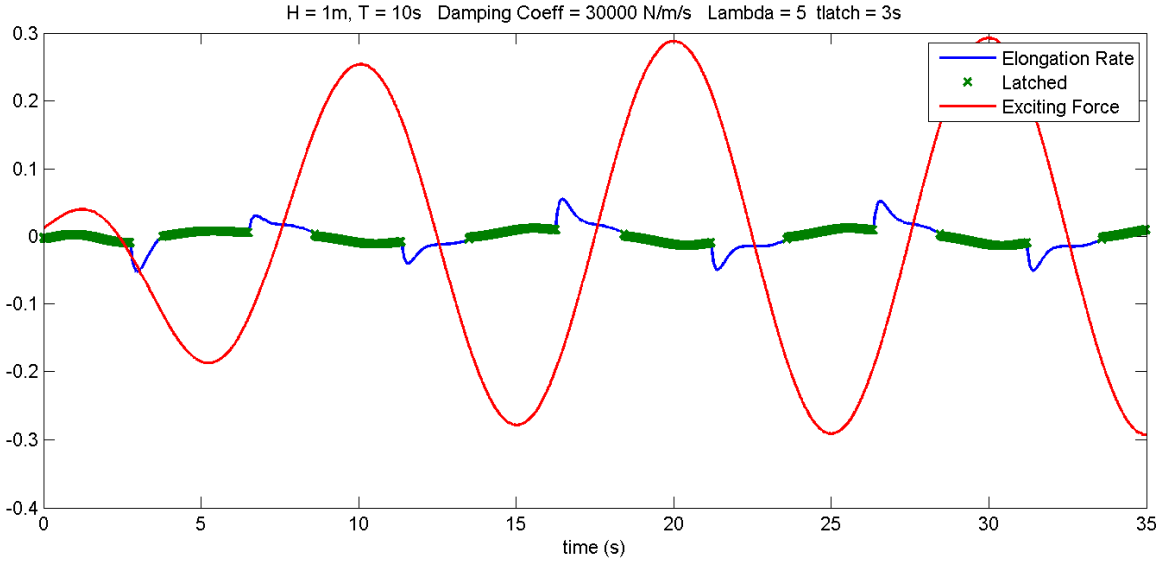


Pavg = 1622 W

Effects of latching at Λ= 5



Pavg = 51 W



Pavg = 16 W