Centrifugal Seawater Desalination System (Wende Li)

My research focuses on the design and analysis of a centrifugal seawater desalination system based on the reverse osmosis (RO) membrane. Typically, the RO membrane allows pure water to pass through from high concentrated water source under high pressure condition. Currently most commercial applications use pumps to generate high pressure. We tend to feed the seawater to a rotating centrifuge machine to generate required high pressure (80 bar). The concept design of the desalination system and the water flow path can be seen in following figure. During design state one of the main challenge is to achieve preferable damping ratio and use smaller external force to vibrate the centrifuge system at the resonant frequency. My objective of this project is to improve the production rate and reduce membrane fouling from structure and dynamics point of view.

Figure 1 Concept Design of the Centrifuge Machine and Water Flow Path