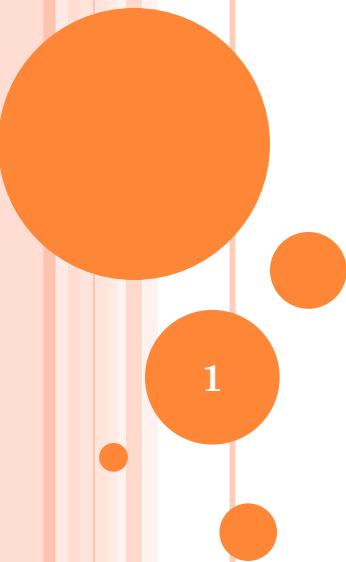


# EFFECT OF TIP SPEED RATIOS ON A TIDAL TURBINE MODEL IN TURBULENT INFLOW CONDITIONS

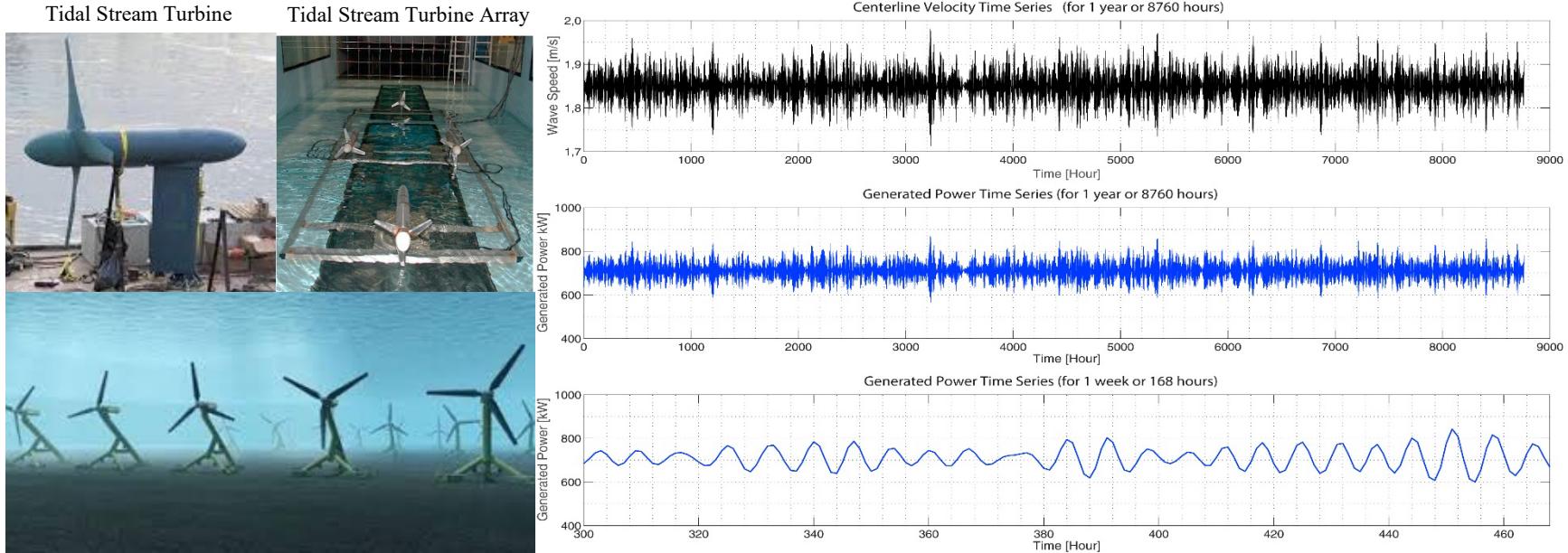


Abstract #: Z15.00005  
To be determined

Cong Han and Arindam Banerjee\*  
Department of Mechanical Engineering & Mechanics,  
Lehigh University, Bethlehem, PA 18015

\*Email : arb612@Lehigh.edu

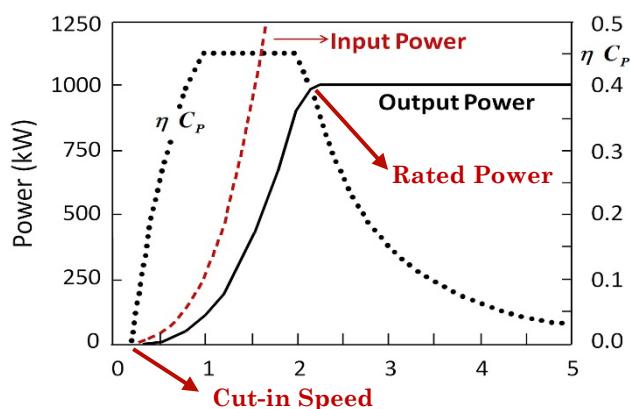
# OBJECTIVE OF THE STUDY



**TIDAL STREAM TURBINES:** Special attention of the majority of studies is focused on one optimal tip speed ratio.

**TIDAL STREAM TURBINE ARRAY:** Upstream turbines have a significant effect on the power efficiency of the downstream turbines.

1 MW tidal-current turbine power curve presented by Boehme Thomas



How does the variation of the inflow speeds affect the turbine operations (Tip speed ratios)?



How do different operating conditions affect the loads perceived by the blades and the wake dynamics of the turbine?

**Focuses of studies:** influence of tip speed ratios on the wake dynamics and wake energy recovery in homogenous turbulence environments.

Gunawan, Budi, Vincent S. Neary, and Jonathan Colby. "Tidal energy site resource assessment in the East River tidal strait, near Roosevelt Island, New York, New York." *Renewable Energy* 71 (2014): 509-517.

Boehme, Thomas. "Matching renewable electricity generation with demand in Scotland." KB thesis scanning project 2015 (2006).