MODELING OF AN UNDERWATER INFLATABLE STRUCTURE UNDER DIFFERENT ENVIRONMENTAL CONDITIONS

Dr. Bing Ouyang
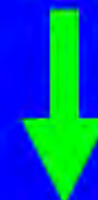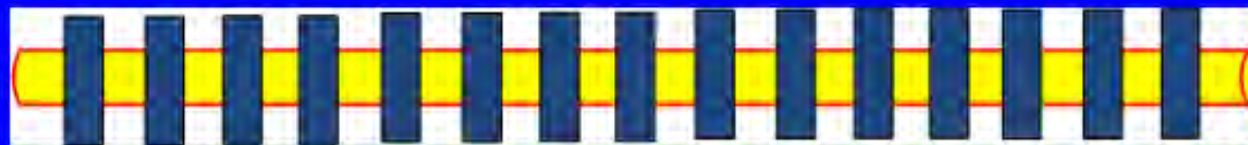
Yanjun (Leo) Li

Shadi Bavar

Jordan Thomas
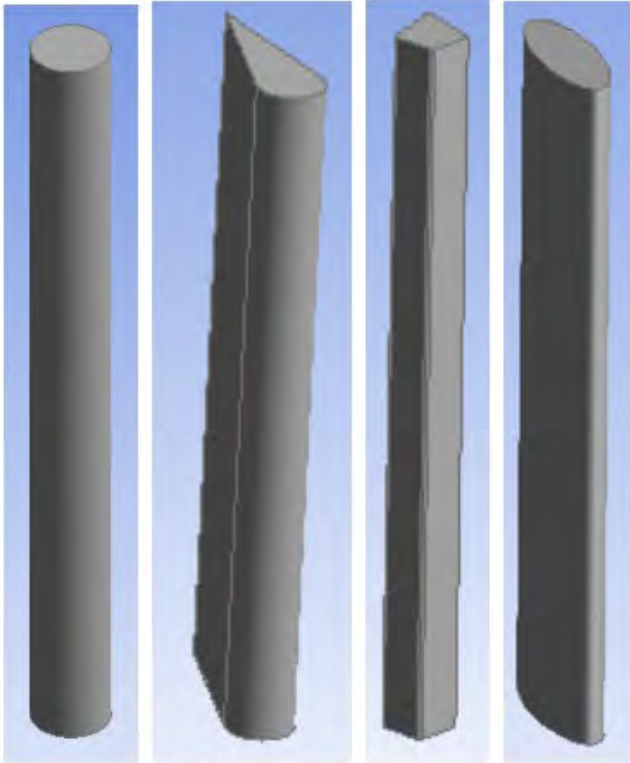
"TWO-WAY COMPRESSION"

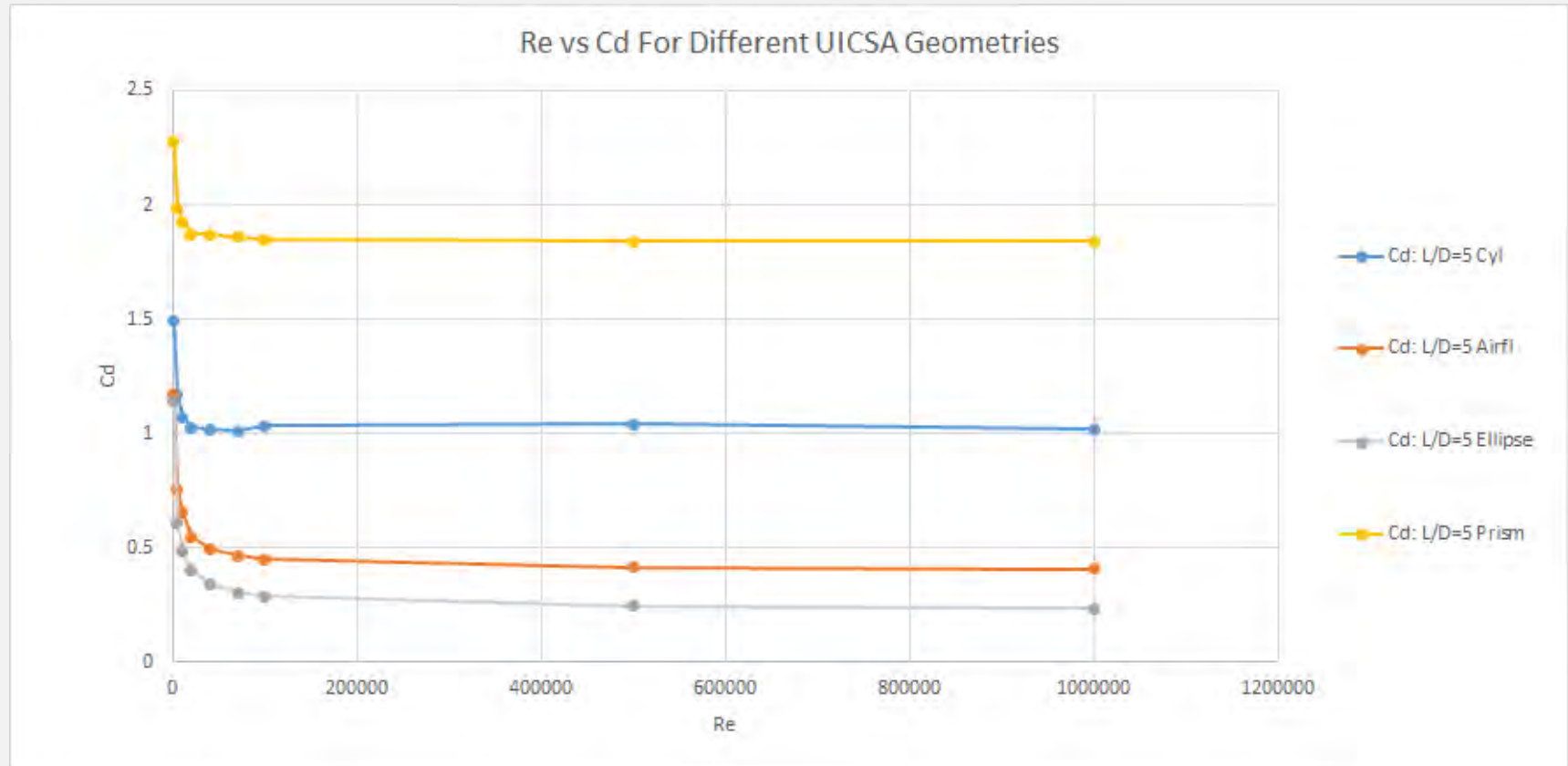Uniform Linear hydrophone array

Co-prime hydrophone array

UICSA package
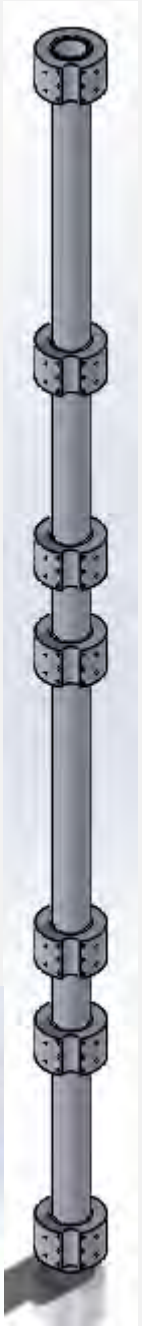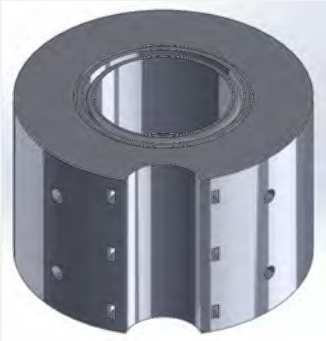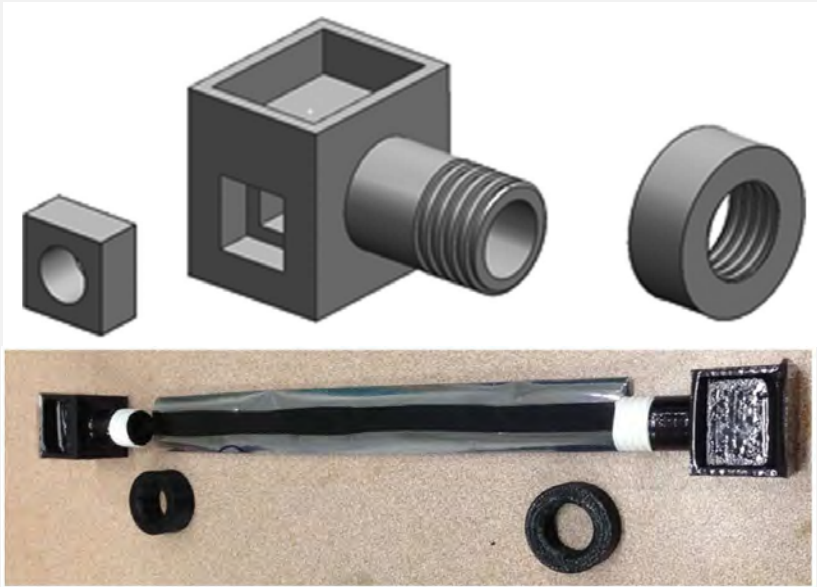
Deployed from helicopter

INDEPENDENT GEOMETRY SIMULATIONS

Cylinder   Airfoil   Prism   Ellipse

Re vs Cd For Different UICSA Geometries

- Cd: L/D=5 Cyl
- Cd: L/D=5 Airfl
- Cd: L/D=5 Ellipse
- Cd: L/D=5 Prism

PROTOTYPE DESIGN

REFERENCES

[1] A. Kulkarni and S. Moeykens, "Flow Over a Cylinder," *Fluent Flowlab*, pp. 1–9, Jan. 2005.

[2] Y. Li, T. C. Su, B. Ouyang, F. Dalgleish, and A. Dalgleish, "Field Testing and Numerical Modeling of Inflatable Structure for Underwater Applications," *Advances in Civil Engineering Materials*, vol. 6, no. 1, pp. 403–411, Oct. 2017.

[3] K. Nidhul, A. S. Sunil, and C. M. Benphil, "Effect of Domain Size and Grid Spacing on Flow Past A Circular Cylinder At Low Reynolds Number," *International Journal of Engineering Research and Technology*, vol. 3, no. 8, pp. 1365–1368, Aug. 2014.

[4] B. Ouyang, Y. Li, T. Zhou, T. C. Su, F. Dalgeish, A. Dalgeish, and F. Ahmad, "'Compressing Two Ways': Initial Study of an Underwater Inflatable Co-prime Sonar Array (UICSA).", May 2018