Abstract Submitted
for the GEC20 Meeting of
The American Physical Society

Spectrum of cavitation luminescence generated by a bioinspired mechanical device[1] XIN TANG, MATTHEW BURNETTE, DAVID STAACK, Texas AM University — Collapsing cavitation is an effective energy focusing method to generate high-temperature and high-pressure singularities at its minimum volume, which result in plasma formation accompanied with strong acoustic waves and light emission. A bioinspired mechanical device was designed and manufactured to generate cavitation repetitively as a plasma source in liquid media. An optical system consisting of an achromatic lens, transmission gratings, and an intensified CCD camera are utilized to probe the cavitation luminescence spectrum non-intrusively. The recorded spectrum for each collapsing cavitation event is corrected by the overall optical system efficiency contributed by all of the components in the optical diagnostic system. The corrected broad band spectrum is not close to a blackbody radiation, and the peak intensity wavelength varies stochastically due to Rayleigh-Taylor instabilities during the cavitation collapsing process.

[1]National Science Foundation (grant PHY-1057175) and the Robertson-Finley Foundation

Xin Tang
Texas A
M University

Date submitted: 16 Jun 2020 Electronic form version 1.4