2nd International Conference on
GREEN & SUSTAINABLE CHEMISTRY
&
International Conference on
PHOTONICS & OPTOELECTRONICS

July 15-16, 2019
Zurich, Switzerland

Energy harvesting from micro scale cavitating flows

Morteza Ghorbani
Sabanci University, Turkey

In this talk, energy harvesting from micro cavitating flows exposed to targeted thin plates will be mentioned. Hydrodynamic cavitation occurs when the local static pressure is reduced to a critical value along with the flow. The generated cavitation bubbles travel to the outlet of the microchannel and collapse once the pressure increases downstream of their originating position. When sufficiently many cavitation bubbles collapse, they release high energy downstream of the flow channel, which can act as a uniform heat source on the targeted plate. It will be that the energy released from the collapse of cavitation bubbles could be harvested when micro scale cavitating flows interacted with a solid body as a targeted area and could be utilized to provide the required power for the daily used miniature devices. Some preliminary proof –of -concept results will be included in the talk. It will be shown that the temperature rise on the surface of the targeted plate depends on both upstream pressure and distance from the micro flow restrictive element nozzle. The variations in temperature rise are different depending on the distance as well as the pressure.

Biography

Morteza Ghorbani is a researcher working in the Department of Mechatronics at Sabanci University. His main research interests are within multiphase flow dynamics and particularly cavitation phenomenon. He worked on cavitation from different point of views from diesel injection engines to biomedical engineering. Cavitation based on the applied perspective can be considered as an advantageous or disadvantageous mechanism. The utilization of the hydrodynamic cavitation in industry is so broad that it can be employed in increasing the combustion efficiency, decreasing the emission and harvesting the thermal energy.

morteza@sabanciuniv.edu