**عنوان مقاله:**

Numerical Study of Heat Transfer Augmentation with High Frequency Ultrasonic Waves in a Rectangular Enclosure

**محل انتشار:**

بیست و ششمین همایش سالانه بین المللی انجمن مهندسان مکانیک ایران (سال: 1397)

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**نویسندگان:**

Milad Setareh - *Department of Mechanical Engineering, Amirkabir University of Technology*

Majid Saffar-Avval - *Department of Mechanical Engineering, Amirkabir University of Technology*

.Amir Abdullah - *Department of Mechanical Engineering, Amirkabir University of Technology*

**خلاصه مقاله:**

The augmentation of heat transfer and acoustic streaming due to high frequency ultrasonic waves are investigated numerically. The incompressible Navier—Stokes andenergy equations are solved by perturbation method because of the great difference between ultrasonic time period and fluid flow time step, so all variables are expanded in zero, first and second order values to overcome this restriction. The model is implemented in OpenFOAM software and two new solvers are developed to calculate some acoustic forces, which these forces are used to study the effect of high frequency ultrasonic waves on the flow filed and the heat transfer. The obtained results demonstrate that acoustic streaming has a great effect on the flow field and heat transfer augmentation and can provide some circulations in the flow field which can enhance the mixing of fluid and heat transfer. By using ultrasonic waves with 80 kPa amplitude. the Nusselt number enhances more than 100%.

**کلمات کلیدی:**

Numerical study, heat transfer augmentation,high frequency ultrasonic waves

**لینک ثابت مقاله در پایگاه سیویلیکا:**

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