MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
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# COMPUTATIONAL STUDY OF THE EFFECT OF THE MICROGRAVITY IN A MICROFLUIDIC DEVICE

**Abstract**

The nature of the liquids makes them susceptible to be affected by gravity; this has been studied since the beginning of space exploration in order to resolve the space travel troubles. Microfluidics is a multidisciplinary field dedicated to the study of fluids at microscale (lesser one millimeter). In this scale the fluids usually have a laminar behavior affecting the transport phenomena. This property has allowed the use of microfluidic in different applications such as membraneless power devices, detection of biomolecules of medical interest as well as in chemical synthesis. It was carried out to study the behavior of microfluidics in microgravity on the International Space Station (ISS). However, to conduct experiments on the ISS is very expensive and not easily accesible. Computer simulation is an alternative that allows us to study this phenomenon without carrying out experiments in this condition. In this work, a "T"-shaped microfluidic device was studied using Solidworks © and Floworks ©. The device was feeding with a fluid with similar properties to human blood in earth gravity conditions (9.81 m s-2) and microgravity environmental (0.001 m s-2). The results show the effect of the gravity increase the pressure of the stream, and reduce the volumetric flow. Also, the presence of particles was studied with several sizes (10 to 75 $\mu$m); it is observed a precipitation since 25 $\mu$m particles.