

MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)  
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DESIGN OF MICRO GRAVITY SIMULATOR FOR EARTH ENVIRONMENT USING  
ELECTROMAGNETIC PULL OVER A CAVITY

**Abstract**

In order to increase space flight capabilities of mankind, it is important to understand the conditions of the microgravity environment. Even though, it has been proven that human crew can survive in a microgravity environment, it is essential to do further experimental research in order to be prepared for the adverse effects of microgravity on human crew. Until now, the only known methods to develop the micro gravity on earth are the drop tower, parabolic flights and neutral buoyancy. One other method to develop the micro gravity is by the use of electromagnetic pull. The concept is same as of Fleming's left hand rule. When electric and magnetic field cross each other the conductor placed between the field feels the force in perpendicular direction of both the field. With the same concept, if we place the object in the chamber having electric field between two wall and magnetic field on other two, the object will experience the upward force and that force will nullify the gravity effect/downward pull. For developing the state of weightlessness for an object of mass 100kg, an upward pull of 9810N is required. If we can able to develop the micro gravity conditions in a static chamber, we can able to perform many experiments like Protein growth rate in micro gravity, combustion of different fuel in micro gravity, biological effects of human (puffy face syndrome and bird leg effect) and condition of animals in long space conditions. Moreover, many experiments of basic fluid mechanics and basic science can also be conducted under microgravity conditions. Such static micro gravity chamber will also help the future astronauts and scientists. Even data capturing for an analysis is easy as the chamber is in static state. If humans are subjected to such conditions, there will be many medical implications induced in the human body that might be harmful. But to decrease the effect, special suits can be provided. This paper examines these in detail on feasible methods of creating microgravity on Earth.