

Worksheet 3 – BEHAVIOR OF LIQUID IN WEIGHTLESSNESS

Task: In the state of weightlessness, the total force acting on the liquid object is zero, so that the liquid object floats in space. In such a situation, such surface tension forces will also be more significant, which are small in a normal situation and can often be neglected. The floating liquid object assumes a shape with the smallest possible surface area by the action of surface tension forces, which is, without contact with other objects, a spherical shape.

On the surface of the Earth, it is possible to observe a state of weightlessness in free fall. The behavior of the liquid in the state of weightlessness can be observed on dripping and falling drops of water. The shape of the water drops is spherical, corresponding to the description above. Drops should be captured with a camera with a short exposure time in good light against a contrasting background.

Solution:

Prepare and run the experiment as specified. Capture the spherical shape of water drops with the camera.

Suggestion:

- When photographing a dripping water source, a short exposure time (1/1000 second or less) must be used, which requires good lighting and/or high sensitivity of the sensor chip. The advantage is then that continuous shooting can be used, thereby increasing the likelihood that at least some of the images in the series will capture the drop. In addition, it is advisable to use the manual focus mode so that the lens is constantly focused on the plane of the falling drops and would not focus repeatedly.
- Based on the above, the ball drops can be easily photographed from the hand with any amateur camera with a manual focus mode and shutter speed preferences. But count on getting many images per usable.
- Another option is to use a sports camcorder with the option to select a high frame rate