

we can let go of the ropes and the boat will not move in any direction. On our boat under test, we have to raise the bow and lower the stern. How much of each is determined by moments.

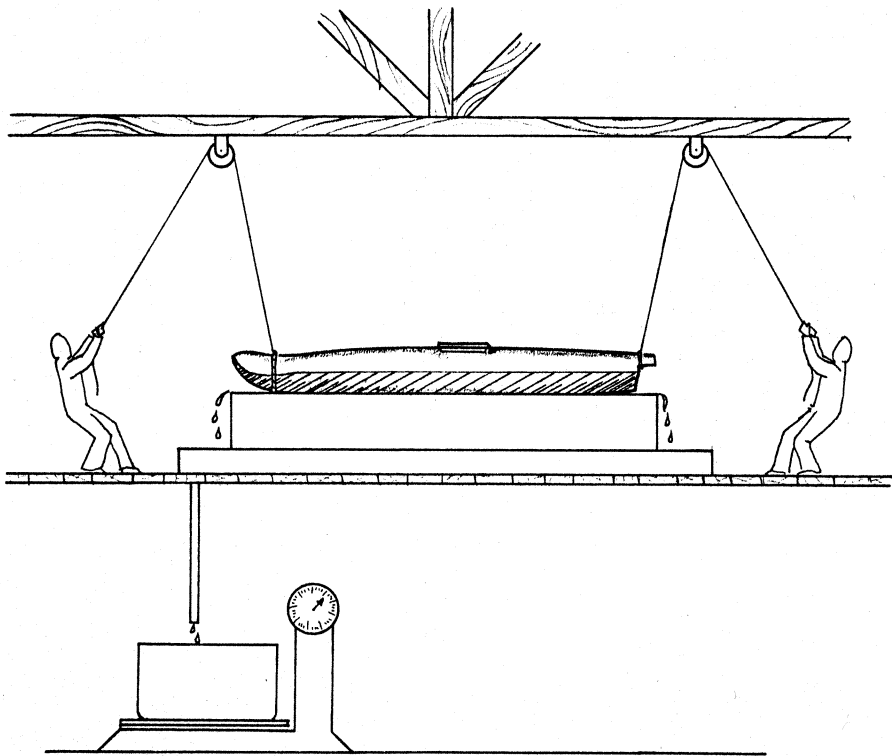


Figure 2. Archimedes' principle - the simulation program accomplishes mathematically what the above does mechanically

Mathematically we get the boat into proper trim by finding the center of balance of the whole boat out of the water. This is called the longitudinal center of gravity (LCG). It is the point somewhere between the bow and stern around which all the boat's weight is acting. We take this position, measured in cm from the bow, and multiply it by the weight of the boat. This is the boat's moment. Similarly we take the total underwater volume of the boat as it now sits in the water and compute its longitudinal center of gravity. The distance of this point, measured from the bow, is multiplied by the weight of the amount of water that would fill the underwater part of the hull. This is the moment of the water displaced by the underwater hull. If this moment is equal to the boat moment, then trim is achieved, the ropes can be loosed and