

Title: *Tethered Ballast Systems for Point Absorbing Wave Energy Converters*
UMD15-03

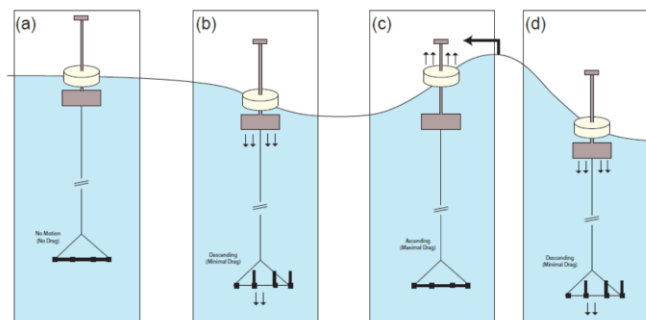
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Applications: A low cost, low maintenance solution for generating electricity from ocean waves, which can be implemented at distances removed from the shoreline. These systems can also be used in powering sensor arrays, communication nodes, or other uses within the coastal zones or farther offshore, having implications for environmental monitoring, security, and communications.

Benefits: This invention offers lower cost and lower maintenance compared to existing wave energy conversion (WEC) devices, and offers the particular advantage that, unlike other wave energy converters, the devices of the present invention can be installed and used far offshore, without the need to be moored to a solid support like a pier. The devices can also be used to deploy sensors to allow real-time communication of weather and other environmental conditions in the open ocean.

Technology Description: The present invention represents an advantageous alternative to near-shore WEC devices, which can be implemented at lower cost at multiple locations. Most point absorber systems now being used or investigated make use of a rigid spar, and are moored devices that move up and down on the water surface and generate energy by capturing the motion of the wave relative to a fixed reference, which often requires a heavy ballast. The present invention offers a more versatile configuration, by replacing the rigid spar with a simple, lightweight design, essentially consisting of a flexible line (i.e., a rope), running from the point absorber on the surface to a weight at the bottom of the line, which is hanging at some depth below the point absorber device. To ensure that relative motion can be captured, the assembly is designed to provide a strong drag force when moving upward in the water column and very little drag force when sinking.

Patent Status: US Patent Issued (US11,156,200)



Conceptual operation of the tethered ballast point absorber system, shown as a wave moves right to left.

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