Surface wave on a semi-toroidal water ring  
SUNGHWAN JUNG, ERICA KIM, MICHAEL SHELLEY, Applied Mathematics Laboratory, Courant Institute of Mathematical Science, NYU — We study the nature of surface waves on a semi-toroidal ring of water. We create this fluid shape by patterning a glass plate with a hydrophobic film which confines the fluid to a precise geometric region. To excite the system, we vibrate the supporting plate up and down, thus accelerating/decelerating the fluid ring along the toroidal axis. When the amplitude of the driving acceleration is sufficiently large, the semi-toroidal water surface becomes unstable to azimuthal and radial waves whose character is constrained by the constraining geometry, and we investigate the dependence of the different surface wave patterns on driving amplitude and frequency.