1163-76-1181 **Jon Wilkening*** (wilkening@berkeley.edu), 970 Evans Hall, Department of Mathematics, University of California, Berkeley, CA 94720-3840. *Quasi-periodic water waves.*

We present a framework to compute and study two-dimensional gravity-capillary water waves that are quasi-periodic in space and/or time. This means they can be represented as periodic functions on a higher-dimensional torus by evaluating along irrational directions. In the spatially quasi-periodic case, we consider both traveling waves and the general initial value problem. The former are a generalization of the classical Wilton ripple problem. In both cases, the nonlocal Dirichlet-Neumann operator is computed using conformal mapping methods and a quasi-periodic variant of the Hilbert transform. We devise a shooting method to compute temporally quasi-periodic water waves that are either hybrid traveling-standing waves that return to a spatial translation of their initial condition at a later time or are nonlinear superpositions of several standing waves with irrationally related periods. Many examples will be given to illustrate the types of behavior that can occur. (Received September 15, 2020)