Abstract Ocean Waves
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1 Introduction

Typically the models for ocean waves are computationally explored to replicate natural phenomena. Instead of aiming towards realism, this work explores aesthetic derivations of a simple state-of-the-art model for ocean waves simulation.

The Basic Model [Fournier and Reeves 1986] based on Gerstner’s, is a classical physics model for realistic ocean waves in computer graphics [Tessendorf 1999]. The behavior of the model depends on a set of parameters. Establishing parameter values that are outside the typical range, and exploring unusual combinations of values for different parameters, may yield abstract and unexpected shapes that are, nevertheless, evocative of water, oceans and waves.

2 Approach

The Basic Model for ocean waves described in Fournier and Reeves [1986] is based on a trochoid – the curve generated by a point at a certain distance from the center of a circle rolling on a fixed straight line (S). Inspired by the circular nature of this model, we replaced the straight line S by an ellipse, altering the trochoid to an elliptical hypotrochoid [Lawrence 1972] (Fig. 2).

3 Results

By varying parameters such as wave length, phase speed, wind strength, number of waves and number of particles for each wave, several families of artifacts were produced. Each family results from the same variation rules of a set of constrained parameters, which results in aesthetically similar artifacts and produces animations of mutating shapes⁴.

References


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⁴ http://abstract-ocean-waves.dei.uc.pt