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## High-Altitude Experimental Test of the Wind-Wave Interaction Models

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We present the idea to experimentally test the empirical models used in fluid mechanics. The models consider that the waves develop due the wind energy transferred from the air to the surface of the water. However, all of those models were validated considering data at sea level, with effectively fixed air density. Here we propose to test the adjustment of the empirical coefficients studying the waves generated in Lake Titikaka, which is located at an altitude high enough (3800 m) to have a reduced atmospheric pressure. Lake Titikaka is located in the North side of the Altiplano (high plateau) in South America. It is shared between Bolivia and Peru, and it is, by far, the largest water body in the region, and at such altitudes in general. So it becomes a dominant geographical and climatic unit in the South American Altiplano, which has a desert-like climate, with monsoon-type rainy season (November to February) and a long dry season (March to October). During the dry season (local winter) the daily temperature cycle goes from maxima around 15 °C (past noon) to freezing minima near -5 °C (before dawn). This temperature span is larger than the seasonal difference, around 5 °C, between summer and winter. Due to its large water mass, the Lake hampers the temperature variations and avoids the freezing of both the lake itself and its shores. The daily temperature fluctuations cause also a daily wind-intensity cycle, with maxima just before the sunset. Lake Titikaka has an elongated shape with a long axis of 120 km in the NW-SE direction, and its short axis of 50 km in the NE-SW direction; with a large peninsula on the South shore (Copacabana). This size, plus deep waters (in excess of 250 m, pelagic condition) allows development of extensive waves produced by the surface winds, coming predominantly from the North. The shores of Lake Titikaka have several geographical features, among others: delta rivers, sandy beaches and rock cliffs. The ("main") study site is located in the large portion of the lake, near a mid-point between Santiago de Huata and the Isla de la Luna (Moon Island) as far possible from the shores.