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SEICHE in a TUB, LAKE and SEA

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The problem given to students at the XV International Physics Olympiad, which took place in 1984 in Sigtuna in Sweden [1], inspired us to learn more about the natural phenomena “seiche” and to make related experiments and observations with our students.
Seiching is an oscillatory natural phenomena, seen in the lakes which are normally long compared with the depth and also narrow. The entire water volume oscillates, like a coffee in a cup that one carries to a waiting guest. There are many such lakes in Sweden and phenomena is studied quantitatively by recording oscillations of the water surface level in various points along the lake, in particular at two opposite ends of the lake. One finds that the oscillations at opposite ends of the lake have opposite phases [1,2].
With our students we studied experimentally and theoretically seiching in a long rectangular container/tub. We look at water surface after shortly lifting and returning back one end of a tub. We recorded the oscillations and analyzed them with the Program Tracker [3]. The measured period of oscillations is compared with the periods derived using three theoretical models. The period is proportional to the length of a tub and inversely proportional to the square root of the water height. The proportionality constant slightly differs in various models.
Studying the literature we learned that seiche was recorded at the Geneva lake [2], as well as on Adriatic sea [4,5]. In various occasions we discussed with our colleagues from the Adriatic region about their eventual interest to establish, in collaboration with relevant institutions, a network of water level recording stations, like around Geneva lake [2], and to involve students to follow and participate in these measurements and study seiche in the Adriatic sea. We plan to discuss about such collaborative project with participants at the GIFT Workshop.
Also, we think to start observing and measuring at the Sava Lake in Belgrade.

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