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Ideas around using Google Earth as a pedagogic tool for teaching wave concepts in the era of Industry 4.0

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The advent of the Fourth Industrial Revolution requires physics teachers and lecturers to re-look at the way physics concepts are traditionally taught in order to accommodate a more interactive and technology-focused teaching approach. In most textbooks wave concepts are presented with the aid of diagrams that are usually drawn in a very abstract way, i.e. as a mathematical function on a (x,y) two-dimensional Cartesian plane or by means of an oscillating string. This makes it difficult for students to visualize wave concepts in three-dimensions and to link them to phenomena occurring in real life. Technology offers us opportunities to explore different avenues for teaching wave physics. Google Earth provides copious examples of water wave phenomena at the surface of rivers, lakes and oceans, that can be used effectively to describe general wave concepts such as refraction, reflection, diffraction, interference and Huygens' principle. We present ideas on how to implement Google Earth images in the curriculum of the second year undergraduate course on Waves and Optics presented to science majors at the University of Johannesburg. The aim is to teach students to also use intrinsic quantitative tools in Google Earth to verify fundamental wave laws and equations. The above will be implemented in the course as from the 2020 academic year.

Apply to be considered for a student award (Yes / No)?

No

Level for award (Hons, MSc, PhD, N/A)?

N/A

Primary author: Dr CARLESCHI, Emanuela (Department of Physics, University of Johannesburg)

Co-author: Prof. WINKLER, Hartmut (Dept. Physics, University of Johannesburg)

Presenter: Dr CARLESCHI, Emanuela (Department of Physics, University of Johannesburg)

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