

Development of the Conceptual Test in Wave Optics – abstract

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This article deals with development of the Conceptual Test in Wave Optics. There is no such test dedicated to high school students, so we took the opportunity to create it. The Conceptual Test in Wave Optics aims to examine students' conceptions in this area, it aims to uncover most common misconceptions in wave optics and it brings a strong tool for testing a level of understanding wave optics concepts. In literature we can find tests with similar area of interest, which can serve as valuable sources of inspiration. We can name The Wave Concepts Inventory (WCI) [1] which is dedicated to older students, The Wave Diagnostic Test (WDT) [2] which is inspecting the wave concepts in general or Light and Spectroscopy Concept Inventory (LSCI) [3] which is focused mainly on spectrum phenomena. The methodology used for the procedure of the test creation is inspired by the following article [4].

Preparation of the test is divided into following steps:

1. Interviews with experienced teachers –identifying problematic tasks.
2. Creation of the conceptual test.
3. Pilotage of conceptual test.
4. Standardization of the conceptual test.

The development of the test was strongly affected by the interviews with experienced teachers, which were recorded last year. It helped to identify problematic tasks for the test, and it also helped to design structure of the conceptual test. Teachers also suggested possible students' misconceptions, which are used as distractors in the test. Textbooks and articles served as another source of test tasks. For example we can mention article by Paula Heron [5], where the task dealing with diffraction of the half-covered slit is described.

This article presents the structure of prepared Conceptual Test in Wave Optics and presents findings from pilotage. It corresponds to steps 2 and mainly 3 in the previous list.

The test is mainly dedicated to Czech high school students in the age about 17 or 18. The reason is that wave optics is taught in the third and fourth year of high school education. Students should be tested only after the topic of wave optics is discussed in the class. This

decision came up from the interviews with experience teachers. Addressed teachers held a view, that students have no preconceptions before the tuition – students do not explain the wave optics phenomena to themselves. The test is composed of closed questions with only one correct answer.

(For purpose of English standardization the different curricula must be taken into account.)

We believe that Conceptual test in wave optics will contribute to research of students' conceptions and ideas in physics. This knowledge will enable to use limited time in tuition more effectively.

References:

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