

How students understand the meaning of quantum state

Quantum physics is the subject that was found difficulties by many university students. It is interesting to know how they understand the meaning of quantum state in many aspects. In this work, we surveyed the student understanding by providing a conceptual test which consisted of open-ended and multiple choices questions. Students could interpret the meaning of quantum state by their own ideas. The sample group was 20 physics students. Moreover, an interview method was used to survey the deep detail from the students and the possible answers from expert view were collected. From the result, we found that only answers of 9 students corresponded to the answers by the experts. The others showed some difficulties about the quantum state relating to energy level and wave function. For example, the quantum state was the energy level of the system or superposition of quantum states was the wave function. These were the interesting information that might help instructors improve students understanding in the future.

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