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Student understanding of inner products in quantum mechanics

TONG WAN, GINA PASSANTE, PETER SHAFFER, Univ of Washington — Inner products play an important role in quantum mechanics, as they describe the overlap between two quantum states, and can be used to find the probabilities of measurement outcomes. We have found that many students struggle with this fundamental idea. We present data from a junior-level quantum mechanics course at the University of Washington that illustrate the difficulties students have calculating inner products for functions that have been represented graphically. In addition, we discuss how these difficulties impact students' ability to find the probabilities of measurement outcomes.

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