Comparison of Students’ Ability to Measure Distance using Wavelength in 1D and 2D Settings

GARY WHITE, The George Washington University — When physics students are asked to measure the distance between two fixed locations using a concrete object like a pencil, virtually all respond successfully; however, in some settings, when asked to perform a similar measurement using wavelength as a ruler, there is less success, especially if the students are first asked to note that the “ruler” to be used is not fixed in length (see “Is a Simple Measurement Task a Roadblock to Student Understanding of Wave Phenomena?,” by M. Kryjevskaia, M. Stetzer, and P. Heron, The Physics Teacher 51,560, (2103) and references therein). I will show some data from introductory classes (algebra- and calculus-based) that replicate this latter result, and also show some interesting features when comparing particular 1D and 2D contexts.