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A virtual tornadic thunderstorm enabling students to construct knowledge about storm dynamics through data collection and analysis

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A visually-realistic tornadic supercell thunderstorm has been constructed in a fullyimmersive virtual reality environment to allow students to better understand the complex small-scale dynamics present in such a storm through data probing. Lessimmersive versions have been created that run on PCs, facilitating broader dissemination. The activity has been tested in introductory meteorology classes over the last three years. An exercise involving the virtual storm was first used by a subset of students from a large introductory meteorology course in spring 2002. Surveys were used at that time to evaluate the impact of this activity as a constructivist learning tool. More recently, data probe capabilities were added to the virtual storm activity enabling students to take measurements of temperature, wind, pressure, relative humidity, and vertical velocity at any point within the 3D volume of the virtual world, and see the data plotted via a graphical user interface. Similar surveys applied to groups of students in 2003 and 2004 suggest the addition of data probing improved the understanding of storm-scale features, but the improved understanding may not be statistically significant when evaluated using quizzes reflecting short-term retention. A demonstration of the virtual storm will be a part of the presentation.