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**On the usefulness of waterborne measurement of particle velocity
in geoacoustic inversion**

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Recent advances in sensor design have led to the development of receiving systems whose elements are vector sensors, i.e., sensors that simultaneously measure the acoustic pressure and fluid motion due to the propagation of acoustic energy at the sensor location. As such, arrays of vector sensors can provide more information about the sound field than arrays made of traditional hydrophones, and thus are attractive for various applications including the inversion for environmental properties. The fundamental question addressed by this paper is: does the use of acoustic vector data versus pressure-only data improve the results of an inversion scheme based on waterborne observations and matched field processing? To our knowledge no experimental data are available yet to allow a detailed comparison of performance between standard (pressure-only) arrays and vector sensor arrays for environmental inversions. For a preliminary study we will simulate the inversion of vector sensor data in the South Elba environment for which pressure-only inversion results and ground truth data are available following the Yellow Shark'94 and Blue Planet'07 experiments. Broadband signals received on fully-populated and sparse arrays will be considered.