

Abstract Submitted  
for the OSS08 Meeting of  
The American Physical Society

**Remote respiration sensing using millimeter-wave radar systems** ERIK BRYAN, CHARLES PHELPS, JOSHUA YOAKUM, ANU GROVER, IZAAK KEMP, DOUGLAS T. PETKIE, Wright State University — Two radar systems capable of detecting directional displacement were used to measure the movement of a subject's chest wall due to respiration. The first system uses a Michelson interferometer setup and a binary-frequency-shifted signal on a 120 GHz carrier to obtain I (in-phase) and Q (quadrature) signals. The relative phase between I and Q is used to determine the displacement. The second system is a heterodyne transceiver operating near 240 GHz, which returns the I and Q signals directly through IF (intermediate frequency) signal processing. Both systems have been able to determine respiration rates from data taken facing a subject head-on. We will present an overview of both systems along with representative data.

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Date submitted: 04 Mar 2008

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