# ACOUSTICS2008/3281
# Environmental effects on frequency behavior of modal attenuation coefficients for sandy bottoms

Wendy Saintval[a], William M. Carey[b], Allan Pierce[b], James Lynch[c] and William Siegmann[d]
[a]University of Miami, RSMAS, 4600 Rickenbacker Causeway, Miami, FL 33149, USA
[b]College of Enginering, Boston University, 110 Cummington St, Boston, MA 02215, USA
[c]Woods Hole Oceanographic Institution, 98 Water Street, Bigelow 203A, MS-11, Woods Hole, MA 02543, USA
[d]Rensselaer Polytechnic Institute, 110 8th Street, Troy, NY 12180, USA

The modal attenuation coefficients (MACs) can be determined using a recent simplification of Biot theory [A.D. Pierce *et al.*, J. Acoust. Soc. Am. **114**, 2345 (2003)]. Numerical calculations use sandy bottom sediments and isospeed, linear, and piecewise linear water profiles, which are simplifications that preserve key features of those obtained in experiments off the New Jersey Shelf. The calculations indicate the importance of downward refracting profiles and the strength of near-interface gradients for increasing energy loss. Principal characteristics of the MACs that are observed from the calculations include: increases with interface gradient, reordering of least attenuated modes, and variations of the frequency power-law exponents of the MACs from $f^{-1}$ to $f^{1}$ at frequencies up to 2 kHz. Evidence of the behavior observed in the calculations is in good agreement with previous analysis of results in Gulf of Mexico experiments [F. Ingenito, J. Acoust. Soc. Am. **53**, 858–863 (1973)], for profiles that were classified as weakly downward refracting or nearly isospeed. [Work partially supported by ONR.]