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### **Horizontal structure of acoustic intensity fluctuations in the ocean**

Barry Uscinski<sup>a</sup> and Jim Nicholson<sup>b</sup>

<sup>a</sup>Cambridge University, Centre for Mathematical Sciences, Wilberforce Rd., CB3 0WA Cambridge, UK

<sup>b</sup>QinetiQ Ltd., Winfrith Technology Centre, Dorchester, Dorset, DT2 8XJ Dorchester, UK

In April 1989 an acoustic experiment was performed over the abyssal plain south of Madeira in which transmissions were made, for about an hour, at 482, 680 and 740Hz from a ship steaming at 5kts to a receiving array towed by another ship 65km away travelling on a parallel course at the same speed. The signals arrived by two paths, an upper path trapped in the surface duct and a lower path via the main sound channel. This paper describes the experiment and analyses the intensity fluctuations in the signal received by the lower path. We investigate the horizontal structure of intensity fluctuations in the ocean when these are mainly due to internal waves. This aspect of such acoustic intensity fluctuations has received little attention until now. The experimental results are compared with theoretical predictions based on the parabolic moment equations for propagation and scattering in randomly irregular media, and on the standard Garrett-Munk model for ocean internal waves. The experimental results and theoretical predictions agree quite well but some new questions arise about the correlation of intensity fluctuations as the acoustic transmission frequency is varied.