

ACOUSTICS2008/2717
**Linear and Circular Adaptive Beamforming Arrays for High
Bandwidth Acoustic Communications**

Jeffrey Neasham^a, David Howarth^b, Bayan Sharif^{ca} and Oliver Hinton^a

^aNewcastle University, School of Electrical, Electronic and Computer Engineering, Merz Court, NE1 7RU
Newcastle upon Tyne, UK

^bTritech International, Morecambe Road, Ulverston, LA12 9BN Cumbria, UK

This paper will discuss the development of a new generation of high bandwidth (up to 32kbits/s) underwater communication products for ranges up to 4km. Multipath propagation is the dominant factor in system performance in both shallow water, horizontal channels and deep water, vertical channels. The properties of such channels will be analysed and the design of both linear and circular receiver arrays will be discussed to maximise reliability. We will then describe how these arrays are combined with the latest 'software' receiver principles to create a powerful and flexible system, incorporating adaptive signal processing with minimal hardware complexity. Finally the performance of this system will be illustrated with results from experimental trials.