

APPLICATION NOTE 4

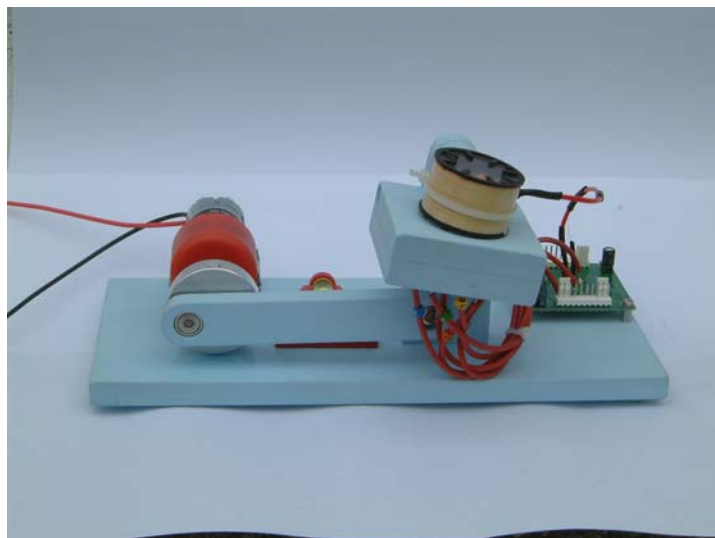
**MECHANICAL RESPONSE OF FLOATING-CORE
FLUXGATE MAGNETOMETERS**

1 Scope

This application note is about the movement of the fluid in Autonnic's range of Floating Core Fluxgate Magnetometers – generally the AR series with either 20°, 35° or 45° degrees of tilt. These components are included within various Autonnic sub-systems including the range of inclinometers.

2 How it was measured

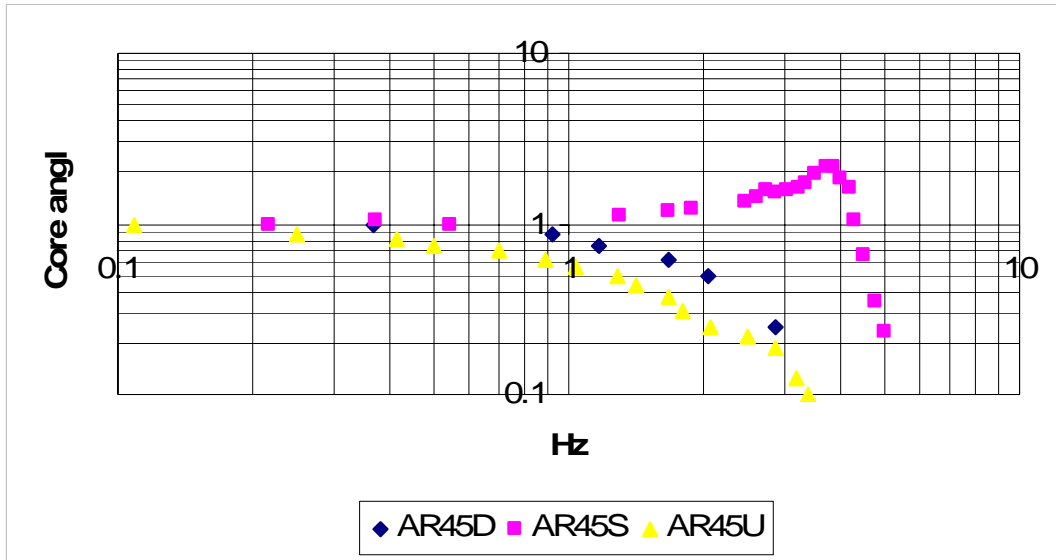
The AR series of fluxgates can be adapted according to Autonnic's patent on inclinometry to behave as precision inclinometer sensors. A modified A4025 OEM inclinometer was set to sample at its highest rate – about 15 samples/s. The fluxgate was fixed in a rig with a motor-driven eccentric set at $\pm 10^\circ$. The mechanical oscillation frequency is set by the motor voltage and the fluxgate is aligned so that one axis in the plane of tilt.



3 Results

3.1 AR45 series

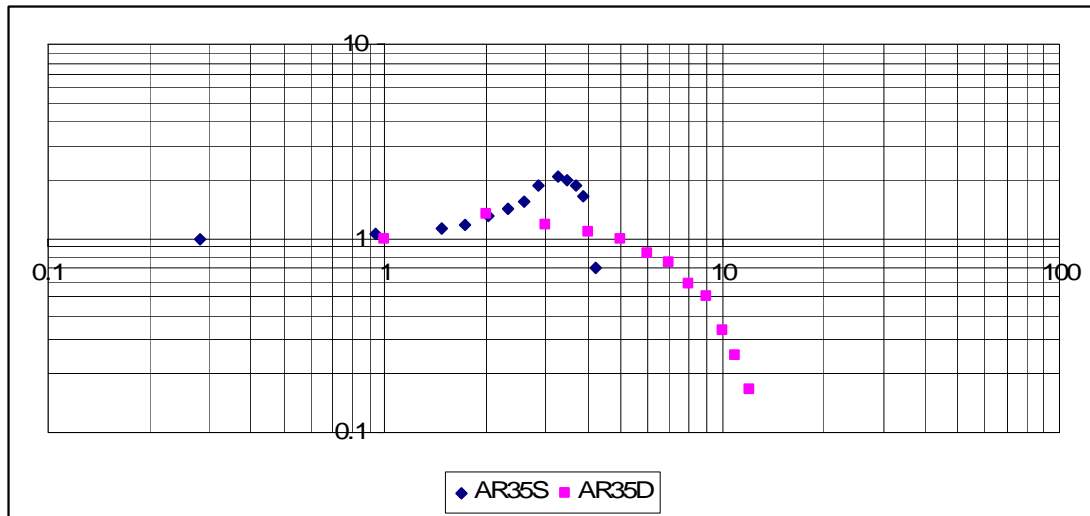
The behaviour of the 45° sensors are shown below.



It can be seen that the undamped S version is suitable for larger slower-moving vessels and vehicles where the mechanical movement spectrum will not contain energy in the 2 to 3Hz band so as to excite fluid resonance.

The new Ultra-damped version A45U is very suited to high-speed small boats where the impacts from small waves occur at much higher frequencies and are well removed from the output so as to maintain compass precision at all times.

3.2 AR35 series



End
November 2006

Autonnic Research Ltd, Tollesbury, Essex, CM9 8SE UK
www.autonnic.com

FluxgateWorld, Autonnic and the *A logo are registered Trade Marks
Copyright Autonnic Research Ltd 2006
Document: AN-4 mech freq response AR series 01-03.doc