

73. The reception of the ultrasound by the structure (moving with speed u) and the subsequent remitting of the signal by the structure back toward the detector is a two step process which may be compactly written as

$$f + \Delta f = f \left(\frac{v + u}{v - u} \right) \implies v = \left(\frac{2 + \xi}{\xi} \right) u$$

with $\xi = \Delta f / f$ and where we have assumed that the structure is moving toward the detector. If $u = 1.00 \times 10^{-3}$ m/s and $\xi = 1.30 \times 10^{-6}$, we get $v = 1.54 \times 10^3$ m/s.