

Topic 14 Ultrasound

Summary

- Ultrasound may be generated and detected by piezo-electric crystals.
- Ultrasound images are formed as a result of the detection and processing of ultrasound pulses that have been reflected from tissue boundaries.
- The acoustic impedance Z of a medium is ρc .
- The intensity reflection coefficient is $(Z_2 - Z_1)^2 / (Z_2 + Z_1)^2$
- Two-dimensional scans may be obtained using a generator/detector consisting of many separate crystals all at different angles of orientation.

Definitions and formulae

- Ultrasound may be generated by piezo-electric crystals.
- Acoustic impedance $Z = \rho c$
- Ultrasound is attenuated in matter following the equation $I = I_0 e^{-\mu x}$
- The intensity reflection coefficient = $(Z_2 - Z_1)^2 / (Z_2 + Z_1)^2$