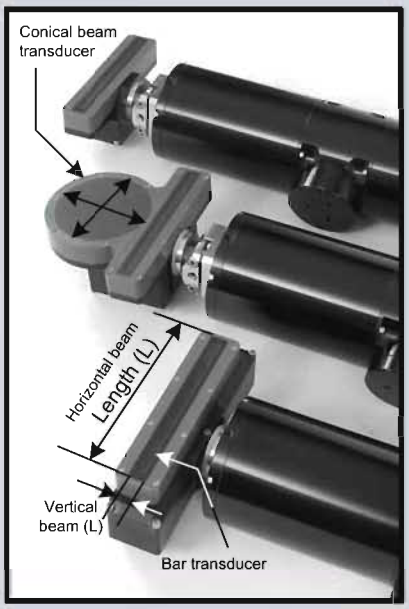
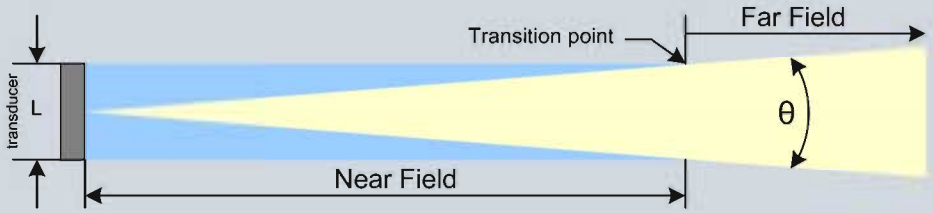
www.kongsberg-mesotech.com

KONGSBERG

Near and Far Field Transition of a Sonar Beam

When a sonar transmits the sound is projected across the entire face of the transducer and not just the center which is commonly how a ***beam angle*** (θ) in degrees is drawn. Close to the transducer constructive and destructive wave forms occur; this results in a constriction of the beam that is approximately ½ the transducer's length (perpendicular to the transmit axis).





The near field/far field transition occurs when the the far field beam is equal to the size of the transducer (perpendicular to the transmit axis). With a bar transducer the near field is different in the vertical and horizontal beam planes whereas it is the same when a conical beam profiling transducer is used.

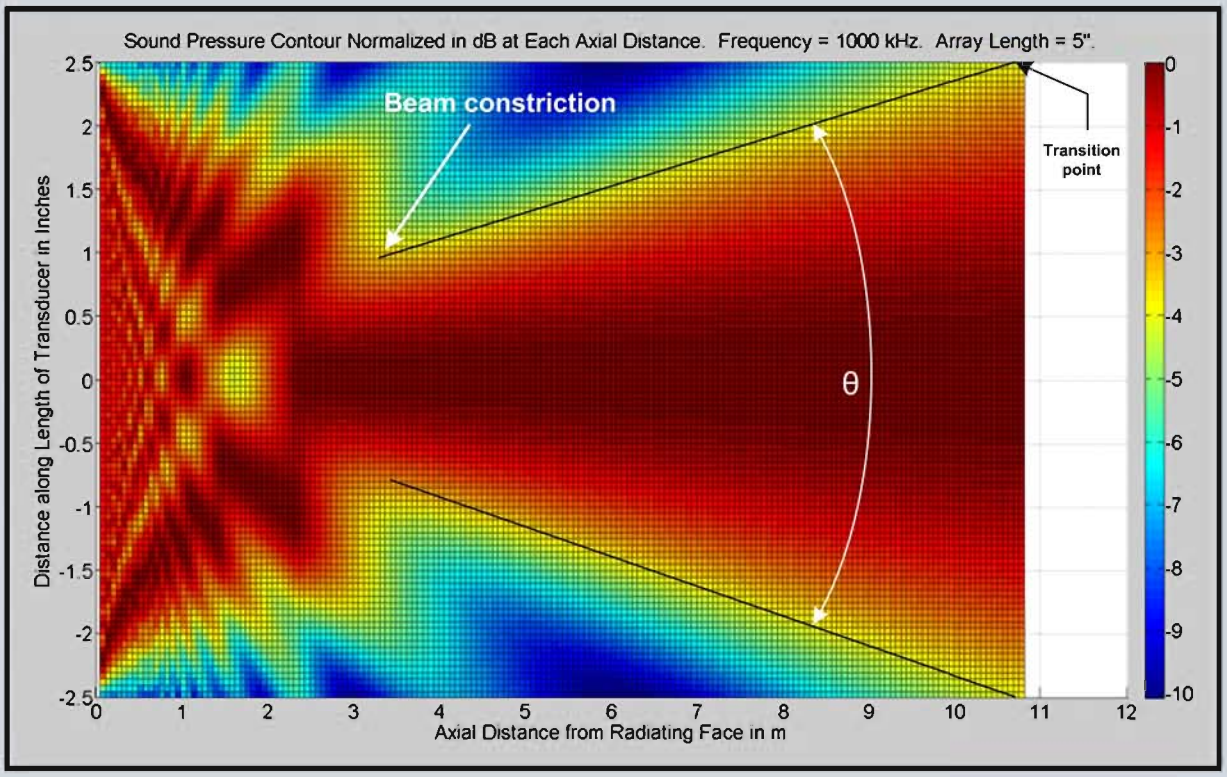
Why is this important?

When a measurement is made in the near field never assume it is taken in the constricted area of the beam. *Therefore, the smallest dimension that can be qualified is equal to the length of the transducer (perpendicular to the transmit axis).*

Transition Point

= length of the transducer / (beam angle in degrees X 1.74) X 100

Calculation can be completed in metric *or* imperial units



Mathematical model of the near field of a 5" transducer at 1000kHz