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**Measuring the equivalent beam angle of echo sounders with  
split-beam transducers**

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When trying to measure the numerical density of marine animal populations with scientific echo sounders, several technical system parameters are determined through a standard-target calibration. The acoustic scattering properties of standard targets are known *a priori*. In a typical standard-target calibration the system gain and the transducer beam pattern are estimated. The system gain parameter is used both when measuring volume backscattering strength and when measuring target strength. The calibrated beam pattern is currently used only for target strength estimation. However, measurements of mean volume backscattering strength also require knowledge of the effective sampling volume of the acoustic beam, namely the equivalent beam angle. This parameter is typically not determined during an ordinary echo sounder calibration. A method for measuring the equivalent beam angle and the transducer angle sensitivity of a specific split-beam transducer is described, and results from exemplary calibrations are presented. Changes in the calibration parameters as a function of environmental parameters, especially the sound speed in water, are discussed.