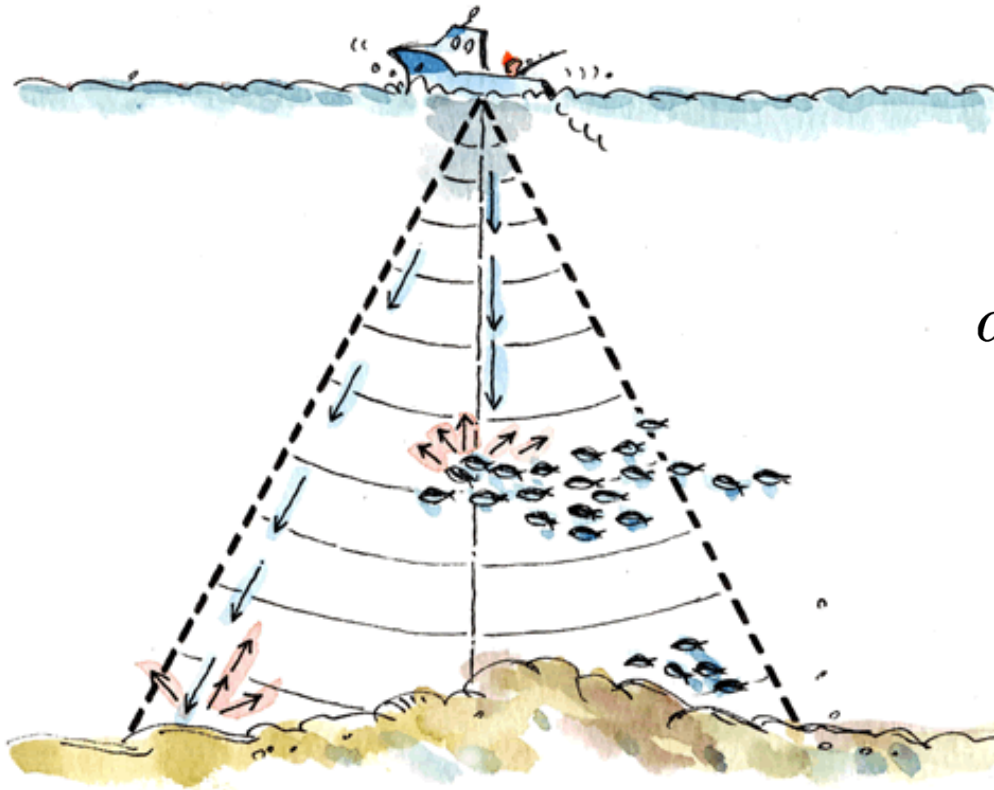


おまけ: 海洋音響学におけるDWBA

魚群探知機



散乱体(魚など)による
(超)音波の(後方)散乱

$$dR(\theta, \phi) = N_T \cdot \frac{d\sigma}{d\Omega} \cdot j \cdot d\Omega$$



$$N_T = \frac{\frac{dR}{d\Omega}}{j \cdot \frac{d\sigma}{d\Omega}}$$

微分散乱断面積を知って
いれば魚の数 N_T がわかる

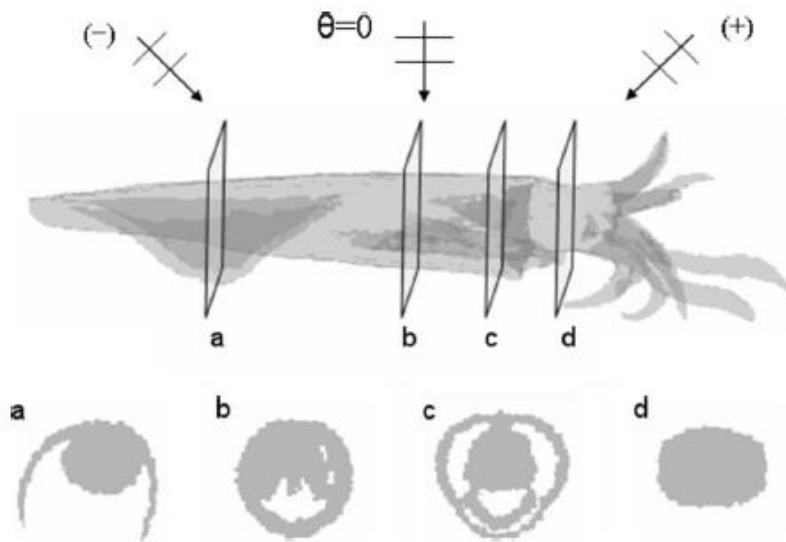
Use of the distorted wave Born approximation to predict scattering by inhomogeneous objects: Application to squid

Benjamin A. Jones,^{a)} Andone C. Lavery, and Timothy K. Stanton

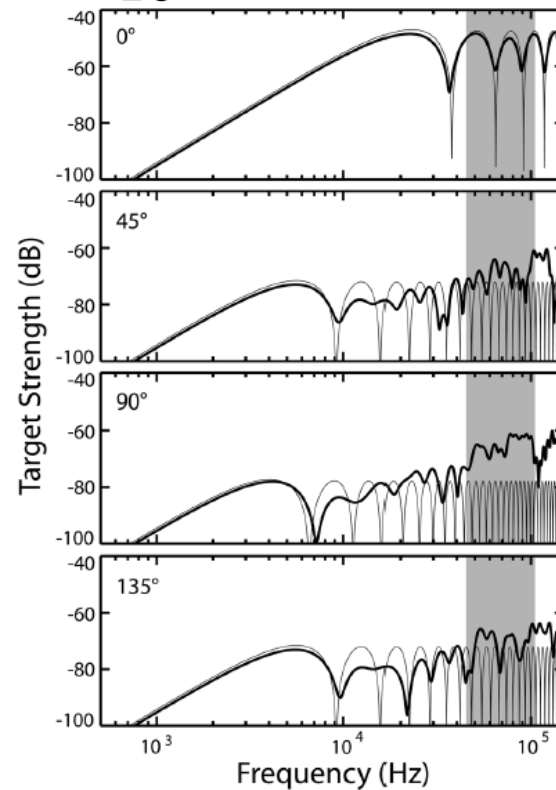
Department of Applied Ocean Physics and Engineering, Woods Hole Oceanographic Institution,
Woods Hole, Massachusetts 02543-1053

J. Acoust. Soc. Am. 125 ('09) 73

$10 \log_{10} \sigma$



イカのモデル化



- Arms-folded numerical model (no fins)
- - - Analytical prolate spheroid model ← !
- Usable band in the experiment

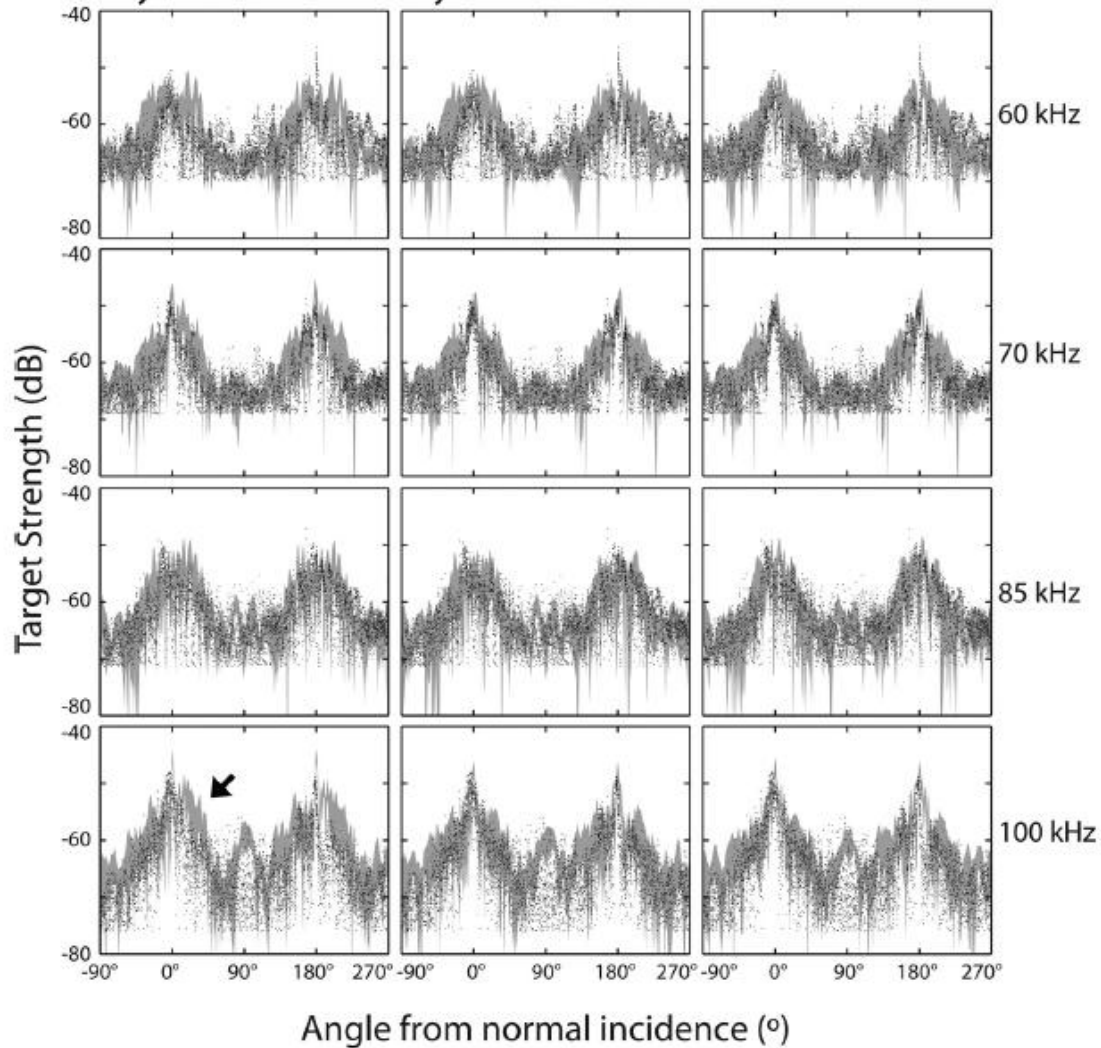
DWBA: イカの内部では局所的な波数を用いる



(A) Original asymmetrical fins

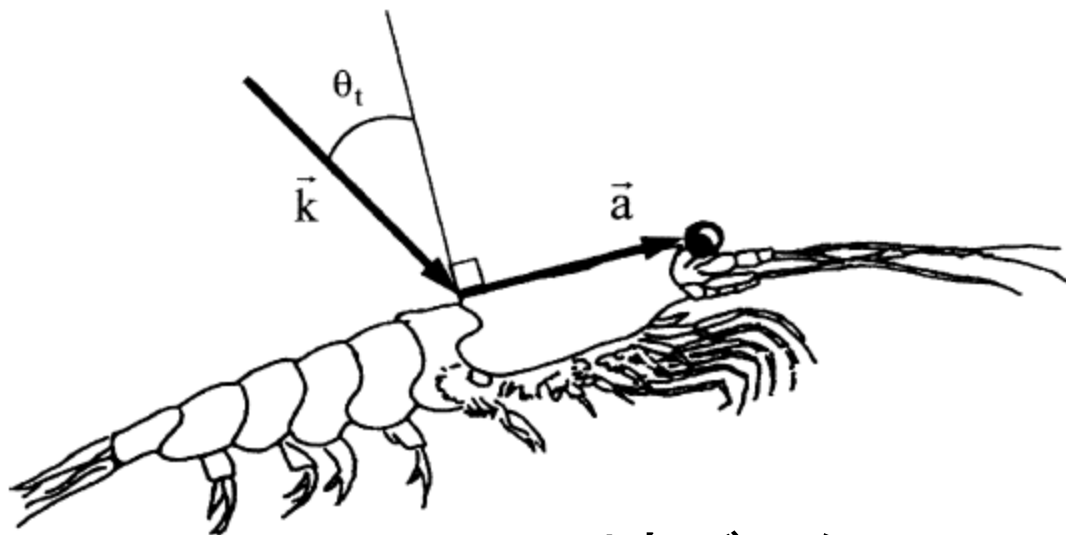
(B) Artificial symmetrical fins

(C) No fins



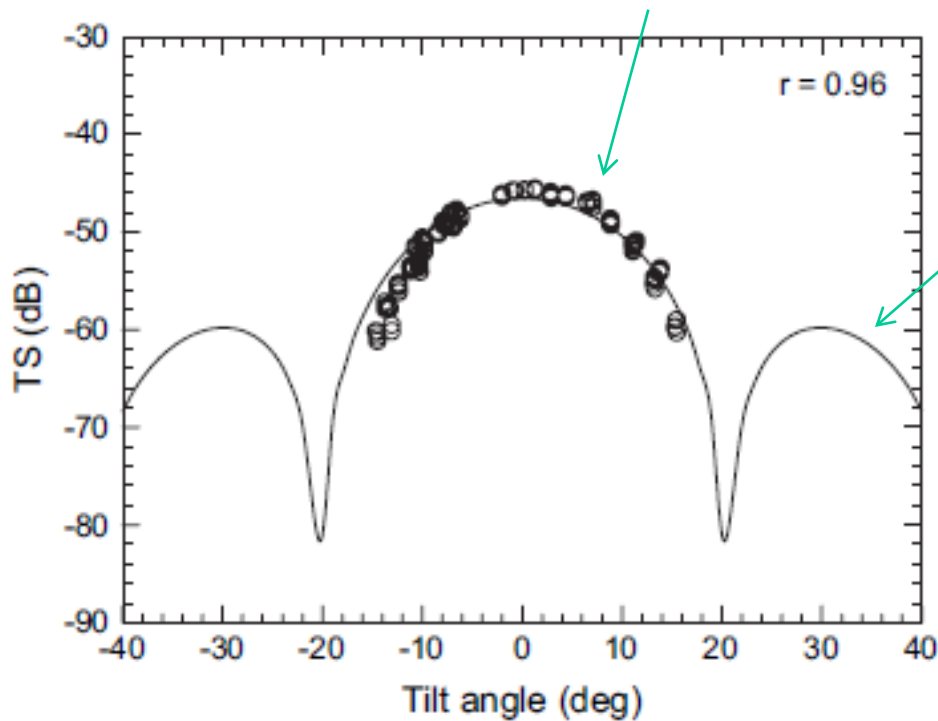
- Experimental data
- Numerical model + noise

W.-J. Lee, A.C. Lavery, T. Stanton,
J. Acoust. Soc. Am. 131 ('12) 4461



オキアミ

測定データ



DWBA