AD-A192 966 A MODAL APPROACH TO ARCTIC NOISE MODELLING WITH IMPLIED VERTICAL COHERENCE(U) NAVAL OCEAN SYSTEMS CENTER SAN DIEGO CA R B WILLIAMS FEB 88 1/1

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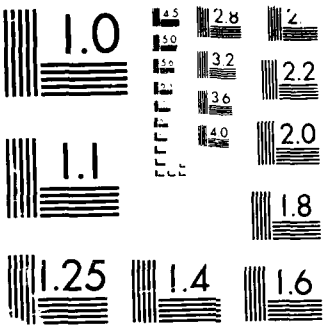

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PORT DOCUMENTATION PAGE

	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	Approved for public release; distribution is unlimited.
4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION: Naval Ocean Systems Center	6b. OFFICE SYMBOL (if applicable): NOSC
7a. NAME OF MONITORING ORGANIZATION: Naval Ocean Systems Center	
6c. ADDRESS (City, State and ZIP Code): San Diego, California 92152-5000	7b. ADDRESS (City, State and ZIP Code): San Diego, California 92152-5000
8a. NAME OF FUNDING/SPONSORING ORGANIZATION: Naval Ocean Research and Development Activity	8b. OFFICE SYMBOL (if applicable): NORDA
9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER	
8c. ADDRESS (City, State and ZIP Code): NSTL, MS 39529-5004	10. SOURCE OF FUNDING NUMBERS

PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	AGENCY ACCESSION NO.
62435N	MA63		DN307 376

11. TITLE (include Security Classification)

A Modal Approach to Arctic Noise Modeling with Implied Vertical Coherence

12. PERSONAL AUTHOR(S)

R.B. Williams

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Presentation/speech	FROM Nov 1987 TO Nov 1987	February 1988	

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	modal energy wavelength correlation lengths

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

Analytic formulas of the modal attenuation coefficients appropriate for deep Arctic under-ice conditions, and modal energy partitioning of ambient noise sources are proposed. These functions can be used, together with various assumed spatial and temporal distribution functions to calculate various statistical ambient noise functions, such as vertical coherence. Vertical noise data between 15 and 50 Hz have been analyzed for model comparison, using a bandwidth of about 5 Hz. These data show that the vertical coherence usually has a sin x/x dependence, with the first zero crossing at one wavelength. Sometimes, however, zero crossing lengths of more than two wavelengths are observed. Longer correlation lengths are consistent with much of the noise energy radiating from a small region, although other interpretations are possible. Initial simple model calculations show agreement with the data. A strong nearby source of noise will cause the correlation to lengthen, while several more distant sources support the one wavelength zero crossing result. Initial sensitivity calculations, however, show that the vertical coherence function by itself is not a good validator of the model functions. Other statistics will be sought to further examine model validity. [Work supported by NORDA and NOSC 6.2 Arctic programs.]

Presented at the Acoustical Society of America, 16-20 November 1987, Miami, Florida.

DTIC ELECTE APR 25 1988 S D E

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
☐ UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT ☐ DTIC USERS	UNCLASSIFIED

22a. NAME OF RESPONSIBLE INDIVIDUAL	22b. TELEPHONE (include Area Code)	22c. OFFICE SYMBOL
R.B. Williams	(619) 553-3096	Code 541

DD FORM 1473, 84 JAN

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M4. A modal approach to Arctic noise modeling with implied vertical coherence. R. B. Williams (Naval Ocean Systems Center, San Diego, CA 92152)

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