AD-A191 895 A PRACTICAL INTERFEROMETRIC TECHNIQUE FOR MASK/WAFER ALIGNMENT DURING PROXIMITY PRINTING(U) NAVAL OCEAN SYSTEMS CENTER SAN DIEGO CA J L BARTELT ET AL. MAY 87 1/1

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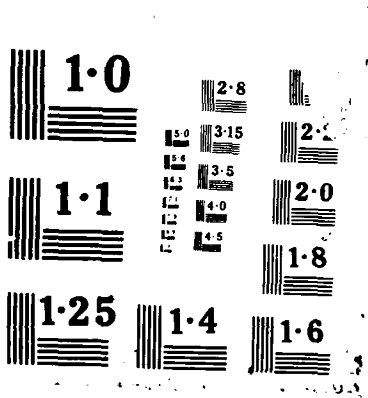
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REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION: UNCLASSIFIED	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT: Approved for public release; distribution is unlimited.
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
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)	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State and ZIP Code): San Diego, CA 92152-5000	7b. ADDRESS (City, State and ZIP Code)
8a. NAME OF FUNDING/SPONSORING ORGANIZATION: Naval Air Systems Command; 8b. OFFICE SYMBOL (if applicable): NAVAIR	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (City, State and ZIP Code): Washington, DC 20361	10. SOURCE OF FUNDING NUMBERS

PROGRAM ELEMENT NO	PROJECT NO	TASK NO	AGENCY ACCESSION NO.
78011N	ET50	R1050	DN388 597

DTIC ELECTE MAR 1 1 1988 D

11. TITLE (Include Security Classification)

A Practical Interferometric Technique for Mask/Wafer Alignment During Proximity Printing

12. PERSONAL AUTHOR(S)

I. Lagnado

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Journal Article	FROM ______ TO ______	May 1987	

16. SUPPLEMENTARY NOTATION

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

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

A new automated technique for sensing translational/rotational mask-to-wafer alignment will be presented that is useful with proximity printing processes such as masked ion beam or x-ray lithography. The technique is based on computer interpretation of fringe patterns created by laser beams diffracted from unique grating structures on both the mask and the wafer. It requires no moving parts and features a simple optical configuration that uses a dielectric cube beamsplitter to recombine the diffracted beams. Being an interferometric technique, precision better than 20 nm is easily achieved, while the novel grating structure and fringe analysis provides a capture range in excess of 20 μm. Additional key features of the technique are that it is insensitive to variations in the gap between mask and wafer and that its performance does not degrade with changes in surface reflectivity or topography as device wafers are processed. A single channel of the grating alignment technqiue has been implemented and tested in a laboratory bench fixture. The required mathematics, computer code, and experimental results will be discussed.

This work was funded in part by the Naval Ocean Systems Center (NOSC) under contract number N66001-84-C-0110.

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
I. Lagnado	619-225-6735	Code 5503

DD FORM 1473, 84 JAN

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A practical interferometric technique for mask/wafer alignment during proximity printing

by

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Abstract

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