NEUTRON RADIOGRAPHY REPORTS WORLWIDE 1964-1977

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This indexed compilation, edited by John P Barton, is based on the Neutron Radiography Newsletter 1964-1977. It was first issued in 1977 preceding the First World Conference on Neutron Radiography held 1981.

PART III

REPORTS

Note

Although over 700 reports are included in this list it is certainly not complete. If readers care to send the editor lists of their published and unpublished reports, they will be included in a future edition.

Reference abbreviations used are:

NSA	Nuclear Science Abstracts (later Atom Index)
EDB	Energy Information Data Base (ERDA, USA)
ERA	Energy Research Abstracts

MAJOR INFORMATION SOURCES

Atomic Energy Review. Vol. 15, no. 2. International Atomic Energy Agency. Vienna, Austria, 1977

Practical Applications of Neutron Radiography and Gaging. Publication STP 586, ed. H. Berger. American Society for Testing and Materials. Philadelphia, Pennsylvania, USA. 1976

Radiography with Neutrons. ed. M. R. Hawksworth. Published by British Nuclear Energy Society, London, U.K. 1975

Applications of Californium-252. Proceedings, American Nuclear Society National Topical Conference. Conf. 720902. 1975

La Neutronographie. Vol. I & II. Kodak-Pathe. 8 Rue Villiot, 75580 Paris, Cedex 12, France. 1974

Bulletin d'Information Scientifiques et Techniques. A.T.E.N. Supp. no. 90. Paris, France. 1971

Transactions American Nuclear Society. Vol. 14, no. 2. 1971

Neutron Sources and Applications. Proceedings American Nuclear Society National Topical Conference. Conf. 701402. 1971

American Society for Nondestructive Testing. Fall National Conference. Materials Evaluation. Sept. 1970

Transactions American Nuclear Society. Vol. 12, No. 2, 1969

Proceedings. Conference Imaging in Medicine. Instrument Society of America. Vol. 6. 1969

Californium-252 Progress. U.S.A.E.C. P. O. Box A, Aiken, South Carolina, 29801, USA. 1969-present

Transactions American Nuclear Society. Vol. 10, No. 2. 1967

Neutron Radiography. Harold Berger, Book 146p. Elsevier. 1965

Neutron Radiography Newsletter. Ed. J. P. Barton and H. Berger. American Society for Nondestructive Testing. 1964-present

SOURCES

Barton, J. P. 1975
Sources for neutron radiography.
Brit. Nuc. Energy Society, Radiography with Neutrons, London

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Sources for industrial radiography.
Rapporteur Paper, USAEC Conf. 701402 1 IV-21

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Sources for industrial neutron radiography.
Proceedings ANS Conf., Neutron Sources and Applications, Conf 901402, Vol. 1, Augusta, April 19-21, 1971

Cutforth, D. C. 1976
Neutron sources for radiography and gaging.
Am. Soc. Test. Mater., Spec. Tech. Pub. 586:20-34
EDB:76-071943

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Neutron source for radiography and gaging.
Symposium on practical applications of neutron radiography and gauging, Gaithersburg, Maryland, USA
Conf. 750216
NSA 31-025970 NSA-31-10 47.300

_____. June 1970
Analysis of neutron sources for thermal neutron radiography.
6th International Conf. on NDT, Hannover, Germany, June 1-5, 1970

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Neutron sources for neutron radiography.
Thesis. Utah State University

Farny, G. 1970
Industrial applications of neutron radiography. Equipment and sources.
6th Int. Conf. on NDT, Hannover, Germany, June 1-5, 1970

MODERATION

Barton, J. P. Dec. 1967
Moderation of neutrons from point sources -- Application - Neutron radiography.
DR/SAR-G/67-45 (CEN/Grenoble)

Berger, H. July 1964
Characteristics of a thermal neutron beam for neutron radiography.
Int. J. of App. Rad. and Isotopes 15:407-444

Cox, A. J., C. Cleave. June 1975
Use of heavy metal inserts to modify the spectrum of neutrons produced by a neutron howitzer.
Int. J. App. Rad. Isotopes 26(6):6-7
NSA 32-024465 NSA-32-10 47.310

Cox, A. J., et al. June 1968
Design of neutron Howitzers.
Int. J. of App. Rad. and Isotopes 19:541-544

Holland, L. and J. Walker. 1971
Absolute measurements on thermal neutron fluxes produced in water by (d,d) and d,t) reactions with 150 keV deuterons.
ANS Conf., Neutron Sources and Applications, Augusta, April 19-21, 1971
Conf. 710402

COLLIMATION

Barton, J. P. 1967
Divergent beam collimator for neutron radiography.
Mat. Eval. 25(9):45A

Barton, J. P. and J. P. Perves. Dec. 1966
Underwater neutron radiography with conical collimator.
Brit. J. Nondestruct. Test. 8(4):79-83

Blanks, B. L., et al. 1969
Improved resolution neutron radiography.
Proceedings of 5th International Conf. on Nondestructive Testing, The Queen's Printer, Ottawa, Canada, pp. 242-246

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Monte Carlo study of neutron collimation by rectangular tubes.
Nuc. Instruments and Methods 68(2):293-297

Choudry, A. and P. K. Bandopadhyay. 1971
Thermal neutron focusing by tapered rectangular collimators.
Nuc. Inst. Methods 92:339-343

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Nuclear Chemistry Group Progress Report, 1968.
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A device for collimating and filtering neutron beams (in French)
French Patent 2,203,342/A
NSA 32-00989 NSA-32-01 46.400

Inouye, T. and K. Ogawa. July 1966
Method of determination of thermal neutron beam collimation.
Nuc. Instruments and Methods 42:309-311

Kedem, D. 1973
A method for obtaining a large area beam from a reactor beam tube for use in neutron radiography.
Proc. of Irradiation Facilities for Research Reactors, IAEA-SM-165/10:165-172
Vienna

Kedem, D., et al. 1972
A method for obtaining a homogenous flux in a reactor beam tube.
NIM 102:87-89

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An investigation of neutron collimators and their application in neutron radiography.
MS Thesis. Univ. New Mexico, Albuquerque, New Mexico. 76pp.

Olsen, J., L. Mortensen. Nov. 1974
A simple and inexpensive collimator for neutron radiography.
Nuc. Instrum. Methods 121(3):617-618
NSA 31-022832 NSA-31-09 46.400

Ponomaren, E. G., et al. 1971
Attenuation of a collimated slow neutron beam by plane, parallel barriers.
Rad. Tech. 6, Translated from Radiats Tekh. No. 6
NSA 33-16101

Sachs, R. D., R. A. Morris. Nov. 1976
Fail-safe neutron shutter used for thermal neutron radiography.
Contract W-7405-Eng-36
EDB-77:067793

VuHong, L. June 1969
Optimisation de la position du collimateur dans un ensemble neutrographie.
CEA-CEN/Grenoble, DR/SAR-G/69-16

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Radiographic examination of iron-containing objects using subthermal neutrons.
U.S. Patent 3,496,358
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Radiographic examination using cold neutrons.
British J. of App. Phy. 16:1051

Bates, J. C., S. Roy. Sept. 1974
Neutron radiography with very cold neutrons.
Nuc. Instrum. Methods 120(2):369-370
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Hawkesworth, M. R. and J. Walker. 1975
Cold neutron beams for radiography through steel.
Conf. Radiography with Neutrons.
Brit. Nuc. Eng. Soc.

Perves, J. P. June 1970
Neutron radiography-thermal and cold neutron beams.
6th Int. Conf. on NDT, Hannover, Germany, June 1-5, 1970
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RESONANCE NEUTRON RADIOGRAPHY

Barton, J. P. 1965
Radiography with resonance energy neutrons.
Physics in Medicine and Biology 10(2): 209-212

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Neutron radiography using a crystal monochromator.
J. of Scientific Instruments 42:549

Bryant, K. R., S. R. Bull. 1974
Resonance energy neutron beams from reactors for radiobiology studies.
NSA 30-05486 NSA-30-02 77.700

Forman, L., et al. 1970
A technique for obtaining neutron radiographs in the resonance region.
Rev. of Sci. Inst. 41

Hewitt, J. S. and G. R. Blumenauer. 1971
An investigation of resonance neutron transmission analysis as a technique for nondestructive evaluation.
Proceedings 8th Symposium on Nondestructive Evaluation in Aerospace, Weapons Systems and Nuclear Applications, San Antonio, Texas, April 21-23, 1971

Hewitt, J. S., et al. Dec. 1974
Novel techniques in neutron radiography with a 35 MeV linear electron accelerator.
Non-Destruct. Test. (Guilford, England) 7(6):315-323

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Enhancing contrast of neutron radiography by energy tailoring of beams.
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Rustad, B. M., et al. June 1965
Single crystal filters for attenuating epithermal neutrons and gamma rays in reactor beams.
Rev. Sci. Instr. 36:48-54

Spowart, A. R. Feb. 1968
The advantages of epicadmium neutron beams in neutron radiography.
Non-destructive Testing, pp. 151-155

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A nondestructive method for the absolute determination of hydride content in zirconium.
J. of Less Common Metals

FAST NEUTRON RADIOGRAPHY

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Radiography with the fission neutrons from Cf-252.
Conf-720902
NSA 32-017342 NSA-32-07 47.320

Bagge, E., et al. 1976
Fast neutron radiography for extended objects by a plastic detector technique.
Conf-760964--25
EDB-77:069634

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The neutron spectrum produced by a paraffin Howitzer operating with 14 MeV neutrons.
Int. J. of Appl. Rad. and Isotopes 20: 683-685

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Role of accelerators in neutron radiography.
Proceedings of the Conf. on the Use of Small Accelerators for Teaching and Research, Oak Ridge, Tennessee, March 23-25, 1970

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Neutron radiography using accelerator sources.
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Toward neutron radiography of radioactive objects in hot cells.
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On the possibility of using a D-T neutron generator for the radiographic inspection of highly radioactive elements.
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Your own personal neutron radiography set?
Matls. Eval. 27(2):12A

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Radiography with fast neutrons.
6th Int. Conf. on NDT, Hannover, Germany, June 1-5, 1970

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Some experiments in fast neutron radiography.
Matls. Eval. 27(12):245

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Fast neutron radiography with Cf-252.
ANL-7895
NSA 26-022731 NSA-26-10 42.40

Berthod, J. Feb. 1970
Neutrographie avec des neutrons de 15 MeV at 3 MeV a l'aide d'ecrans scintillateurs.
CEA-CEN/Grenoble, NT/ACC/70-01

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Fast neutron radiography.
Missiles and Rockets Symposium, U.S. Naval Ammunition Depot, Concord, California, April 18, 1961.

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The use of fast neutrons for radiographic flaw detection.
6th Int. Conf. on NDT, Hannover, Germany, June 1-5, 1970

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Fast neutrons defectoscopy development.
7th International Conf. on Nondestruct. Testing, Warsaw, Poland
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Defectoscopy of thin heavy metals by means of fast neutrons.
Defektoskopiya 1:35-39 (in Russian)
NSA-20-25454

Fast Neutron Radiography -- continued

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Fast neutron radiography of composite articles.
Defectoscopy, p. 188-189

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Use of fast neutrons in defect detection in manufactured components.
Defektoskopiya 3:19-21 (in Russian).
NSA 21-247

Gorbunov, V., et al. 1970
Control of reinforced concrete construction by means of fast neutrons.
IZV. Vyssh. Ucheb. Zaved, FIZ No. 3: 139-141 (in Russian)

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Problems of fast neutron radiography.
7th Ann. Biomedical Sciences Instrumentation Symposium - Imagery in Medicine, The Instrument Society of America, held at Univ. of Michigan, May 19-22, 1969

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Improved images in 14.5 MeV neutron radiography.
Mat. Eval. 35(4):52-58

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Photographic detection of fast neutrons.
Physics in Medicine and Biology 10: 877

Vasilik, Dennis, G., et al. Jan. 1972
Response of film/converter combinations to 14.3 MeV neutrons for fast neutron radiography.
NSA 26-015355 NSA-26-07 46.40

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Theoretical image-forming quality of fast-neutron radiography.
Thesis. Georgia Institute of Technology.

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Theoretical modulation transfer functions of fast neutron radiography.
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Fast neutron radiography with a neutron generator.
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Measurement of modulation transfer functions of neutron radiography systems.
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Neutron radiography - Method and apparatus using track etch technique.
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NSA 25-6512

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Track-etch neutron radiography.
U.S. Patent 3,457,408
NSA 19-38294

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Method of recording the tracks of ionizing particles.
French Patent 2,092,829
NSA 26-050665 NSA-26-21 46.11

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Some preliminary results on transfer method in neutron radiography.
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Neutron radiography with a nitrocellulose film camera for fuel element testing.
Kerntechnik 18(5):209-211
EDB-77:017925

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The neutron radiography. Application of the solid track detectors.
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Toulouse, France
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Barbier, F.F.L.P., G.J.A. Renard. 1971
A product for use in neutron radiography.
French Patent 2,203,109/E/
NSA 32-630

Barbier, J. F. 1970
Improvement of the performance of cellulose nitrate film for recording ionizing particle tracks (in French)
Conf-700705 (Vol. 1)
NSA 28-018262 NSA-28-08 46.11

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Contrast improvement of images obtained in cellulose nitrate film by track-etch methods.
Trans. Am. Nuc. Soc. 13:530
NSA 25-4346

Barton, J. P. Dec. 1967
Scintillators in neutron radiography.
DR/SAR G/67-46 (CEN Grenoble).

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Improvements in or relating to radiographic examination using neutrons.
U.K. Patent 1,138,537
NSA 23-11735

Barton, J. P. and M. F. Klozar. 1970
Method for efficiency gain in neutron radiography.
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Advanced radiographic imaging techniques.
Mater. Eval 31(7):133-144
NSA 28-012825 NSA-28-06 42.40

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Am. Soc. Test. Mater., Spec. Tech. Publ. 586:35-57
EDB-76:071944

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Evaluation of radiographic paper for thermal-neutron radiography.
Trans. Am. Nuc. Soc. 21:148-149
NSA 32-011490 NSA-32-05 42.400

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Characteristics of a thermal neutron television imaging system.
Mat. Eval. 24:475-481

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A thermal neutron television system for post-irradiation annealing studies.
Trans. Am. Nuc. Soc. 8(1):73-74.

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Real-time thermal neutron radiographic detection systems.
8th World Conf. on Non-Destruct. Test. Sept. 6-11, 1976, Cannes, France

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A Polaroid film method for transfer neutron radiography.
Nuc. Sci. and Eng. 18:137-138

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Improved sensitivity and contrast, track etch thermal-neutron radiography.
Trans. Am. Nuc. Soc. 15(1):123-124
NSA 26-043015 NSA-26-18 46.11

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An operational thermal neutron image intensifier.
J. of App. Physics 36:2093-2094

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NSA 29-024131 NSA-29-10 42.400

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IEEE Trans. on Nuc. Sci. 13(2):79-83

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Neutron detection and radiography.
U.S. Patent 3,891,852
NSA 33-003043 NSA-33-02 46.110

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Neutron detector of the track-damage type.
U.S. Patent 3,735,135
NSA 28-015534 NSA-28-07 46.11

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Neutrography product.
French Patent 2,067,103
NSA 26-033400 NSA-26-14 46.11

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Comparative yields of different converters used for the photographic detection of thermal neutrons.
Bull. Inform. Sci. Tech. (Paris) 172: 55-64 (in French)

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Mat. Eval. 31(7):133-144

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Television system for neutron radiography using small sources.
Trans. Am. Nuc. Soc. 12

Bukarev, V. A., et al. 1967
Investigation of the sensitivity of certain neutron detectors used in radiography.
Defectoscopy 3:236-239

Buschmann, H. T., et al. Feb. 1976
New applications of photographic materials in science and technique.
Appl. Phys. 9(2):85-104
EDB 77:008305

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Microchannel image intensifier for neutron radiography.
7th International Conf. on Nondestrct. Testing, Warsaw, Poland
NSA 31-00483 NSA-31-01 42.400

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Use of channel multiplier arrays.
NSA-28-015540 NSA-28-07 46.11

Chu, D., et al. Feb. 1976
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IEEE Trans. Nuc. Sci. NS-23(1):634-639
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Trans. Am. Nuc. Soc. 21:113-115
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Improvements in or relating to neutron sensitive camera tubes.
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Essais de neutrographie en direct.
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Track etching - some novel applications and uses.
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J. Appl. Phys. 42(12):5161-5167

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Some problems of the preparation of amplifying luminescent screens for neutron radiography.

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The role of internal conversion electrons in gadolinium-exposure neutron imaging.
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Analytical model of the recording process in neutron radiography.
Trans. Am. Nuc. Soc. 13:542
NSA-25-004251 NSA-25-03 24.50

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Isotopic conversion in gadolinium-exposure neutron imaging.
Nuc. Instrum. Methods 118(2):583-587
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Nuclear radiation conversion enhancement with inhomogeneous converters and intensifiers.
Nuc. Instrum. Methods 119(2):389-393
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A framework for radiation-conversion track-etch imaging systems analysis.
Nuc. Instrum. Methods 121(3):477-482
NSA-31-022689 NSA-31-09 46.110

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Neutron imaging with thin gadolinium converters.
Nuc. Instrum. Methods 109(2):253-255
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Directional effects in track-etch imaging.
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The use of Polaroid positive film in radiography with beams of thermal neutrons.
Non-destructive Testing 4:45-48

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Some measurements of the resolving power of the intensifying screens used for radiographs with beams of thermal neutrons.
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New method of shortening exposure times in neutron radiography.
Brit. J. Non-destruct. Test. 14(2):57-58
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Trans. Am. Nuc. Soc. 15(1):140-141
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NIM 106:397-406

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Thermal neutron television system using a high yield neutron generator.
Nuc. Instr. and Methods 62:311-315

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Comparison of several three-dimensional radiographic methods.
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