

40,000 AMPERES/4 MeV...

PHYSICS INTERNATIONAL GENERATES THE WORLD'S MOST INTENSE ELECTRON BEAM

Physics International's B² Pulsed Radiation Facility is now producing the world's most intense electron beam (40,000 amps/4 MeV) as a routine operation. With this beam PI can precisely deposit upward of 5,000 joules of energy in 30 nanoseconds as well as diagnose its effects accurately.

This high electron energy (4 MeV max.) permits deeper penetration and energy deposition than is possible at lower energy levels. The energy deposited (both calculated and experimental) as a function of depth in aluminum is shown in the curve below.

This intense current (40,000 amps) allows uniform deposition at high flux levels over a large spot size. Thus wave propagation studies can be carried out in one-dimensional geometry. For an energy density of 70 cal/cm², spot size can be 3 cm. in diameter. Intensity can be increased to more than 1000 cal/cm² for spot of 4 mm diameter, much greater than has previously been publicized.*

Experimental and analytical studies of the thermo-mechanical response of materials are being conducted at PI. This is a complete, coordinated experimental-analytical service for electron beam deposition studies.

Experimental studies, using advanced diagnostic equipment and techniques, have included beam monitoring, damage analysis and energy deposition measurements. Programs are now underway that will include measurements of the dynamic pressure and velocity response.

In the analytical program, energy deposition calculations (see curve) are made and used as a time-dependent input in PI's one- and two-dimensional, elastic-plastic hydrodynamic codes, to provide detailed information on the dynamic response of the irradiated material.

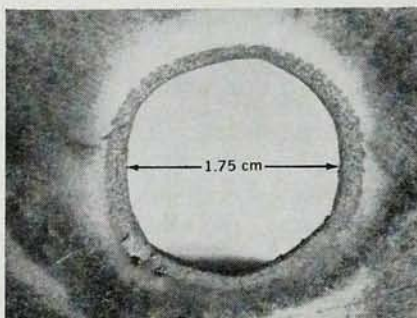
The electron pulser used in these experiments is equivalent to the PI Pulserad Model 730. Other models are available, ranging in output from 2 MeV and 20,000 amperes to 10 MeV and 500,000 amperes. The pulsers, in addition to operating in the electron mode, are quickly converted to operations in the prompt gamma mode. This is accomplished by impinging the electrons onto a high-Z target to produce bremsstrahlung X-rays.

*See "Physics Today," Vol. 19, No. 8, p. 107 (1966)

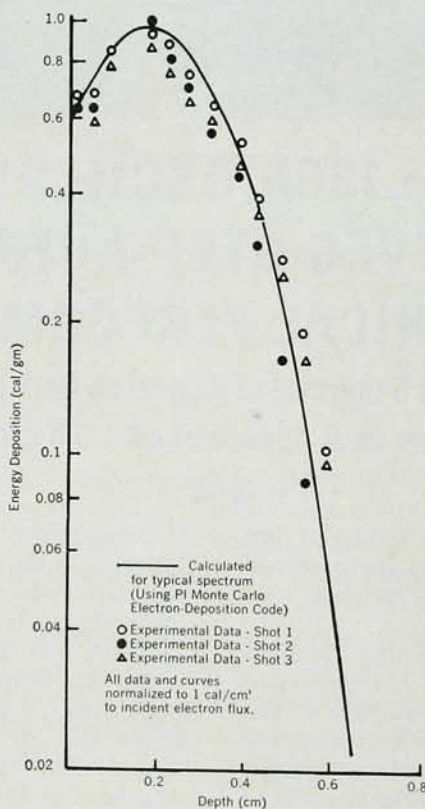
We would be happy to discuss our capabilities in these fields with you. Phone or write us today.

PHYSICS INTERNATIONAL COMPANY

2700 Merced Street, San Leandro, California
Telephone: (415) 357-4610



A spalled 0.008" thick tantalum, easily generated by a single pulse.



Theoretical and Experimental
Depth-dose profile
in aluminum.

LETTERS

(Continued)

(1) A quarterly cumulating list of the papers in journal A showing the papers in journal B that refer to each. A similar list should also be issued of items in journal B showing later comments. (These indexes need not, indeed do not, replace standard author and subject indexes.)

(2) The individual papers should be removable (perforated in the margin) without destroying the journal. Personal users will find this convenient. Librarians with uncooperative readers will probably find it a menace, but it does give them the opportunity, after a period, of removing papers no longer of current interest and keeping only those that seem likely to be of fairly permanent value so reducing the bulk.

(3) Papers in journal A that prove to have some permanent value might eventually be made available together with any commenting items in journal B in microform or as a third journal.

Some of your readers may think that by proposing journals as an alternative to PIE I have missed the point. Please be assured that this is not so. I appreciate the disadvantages of the present preprint and publication methods and that PIE offers one solution to them. What I wish to suggest is that adaptations of existing methods may be preferable to introduction of a completely new system.

D. Alasdair Kemp

Royal Observatory, Edinburgh

A CORRECTION: On page 103 of the November issue of PHYSICS TODAY an editorial change altered the meaning of one of the sentences of Edwin McMillan's obituary of Vladimir Veksler. McMillan's independent discovery of the principle of phase stability did not take place at Berkeley as stated but at the Los Alamos Scientific Laboratory, where he was on leave from the University of California. The work was submitted for publication on his return to Berkeley after the end of the war. □