

J. DAVIS

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applications.

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**B. Plasma models**

Implosions & Pinches are efficient x-ray producers. XPP  
2. Simple pinch dynamics

i.e., the explosion of the pinch after the radiation pulse.



stream. However, if the current is appreciable the stratification

microspheres (Hoerlmann 191950/45) it is necessary to resolve

the radiative properties of one-dimensional plasma impo

(DDG)

ized in Table I by their pulse rise time, the maximum electric

full power.

	Nominal	Nominal	x-ray	
Double Eagle	PI	8	3	15 (Ne K)
Owl II	NRL PI	1	1	Stallings, 1976







TABLE IV. Comparison of X-ray spectra

Reference	Pinhole	Soft x-ray spectrum	XUV spectrum	Resolved spectrum
Aranchuk, 1985	W			
Bleach, 1982	Ar		Ne,Ar,Kr,Xe	
Duston, 1981	t	Ar	Ar	
Duston, 1984	t	Ne,Ar,Kr		
Gersten, 1981	s	Ar		
Hammel, 1985		Ar		
Maxon, 1983	t	Ar	Ar	N
Pearlman, 1981	w	Ar,Kr	Kr	
Stewart, 1987		Ar	Ar	Ar



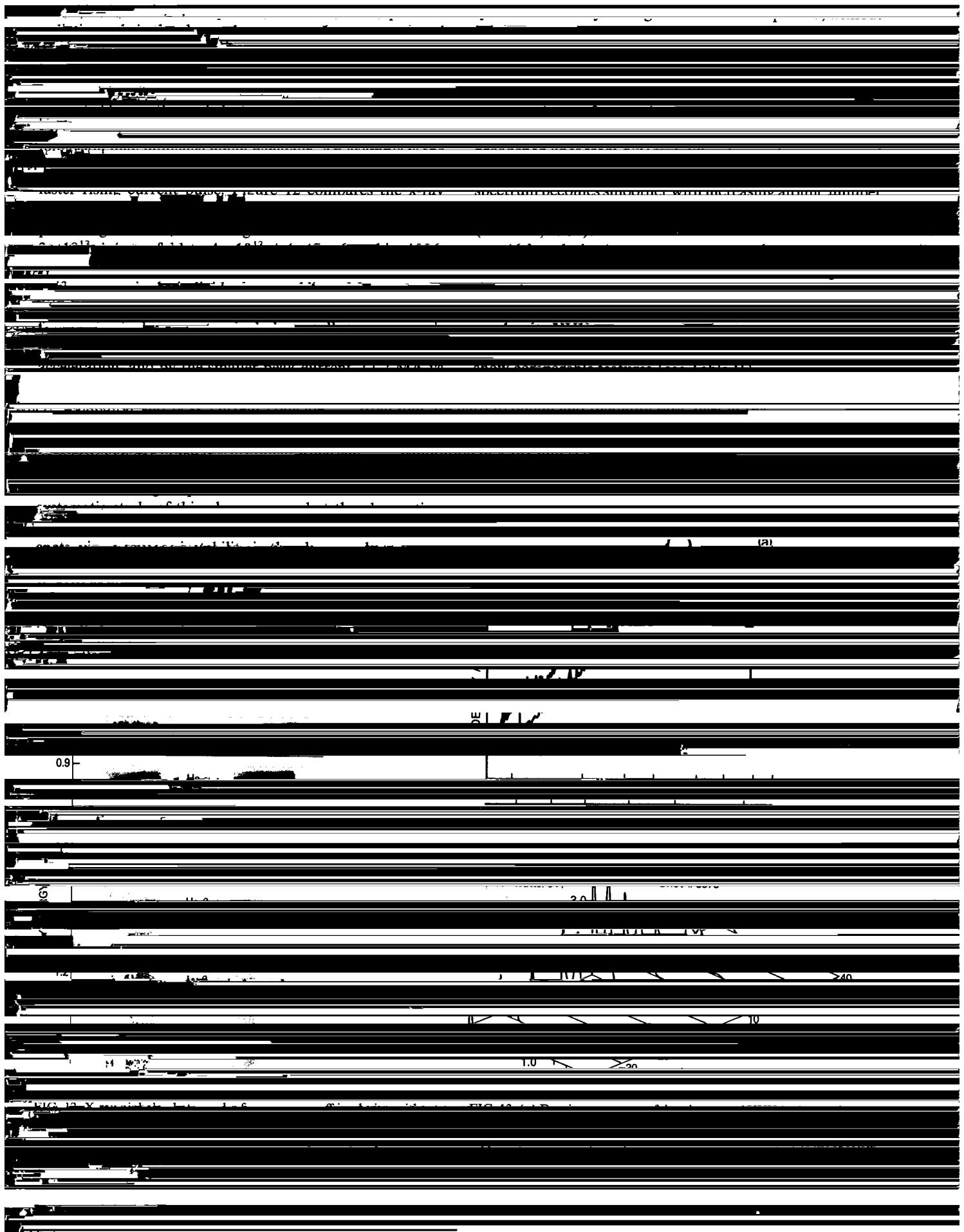


panel (a) and 4.5 kJ for panel (b), to 6.75 kJ for panel (c). Could dominate the harder part of the radiation output

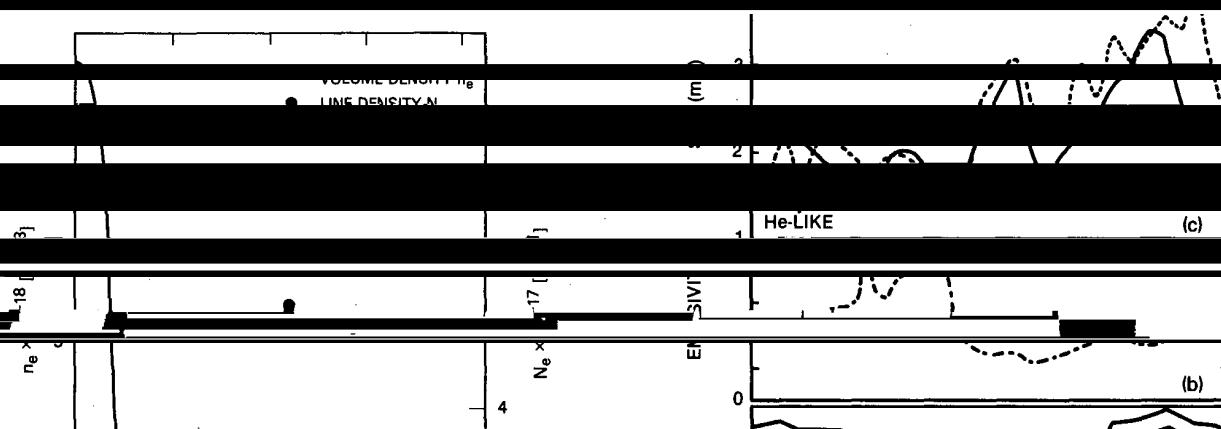
compression to a high density.

ANODE

CATHODE



size of the apparent pinch size in He- and H-like x rays (mid-



### **III. THEORETICAL MODELING**

the radiation and emitters) applies for the plasma's entire

so, one would have to be collisional over a cylindrical shell satisfies

frequency ratio is  $2 \times$  larger. Hence, most electron collisions

good estimate for the implosion time, because in this case the

### Sec. III C.

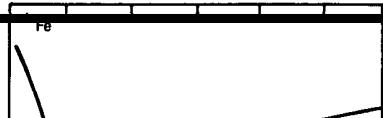
#### 1. Snowplow model



$$\frac{q_0 L^2}{4\pi} \int d\tau r [n_i k (\bar{T}_i + \bar{k} T_e)]$$

$$\sim N_e k \bar{T}_e \times \frac{\int dr r n_e k T_e}{N_e \bar{k} T_e},$$

$10^{-24}$



Ions are unimportant for the ionization equilibrium because

velocity.

FIG. 17. Prestacking condition for the ionization equilibrium.

density  $n_e(r)$  and current density  $j(r)$  are no longer con-

stant,  $\partial j/\partial r \neq 0$ .

the current density is related to the power, which can

[REDACTED] without violating the Bremen condition or invoking [REDACTED] items generally do not contain data on the electrical part

[REDACTED] in the windlass room with medium [REDACTED]



Current	$I$	1 MA
Pulse length	$\tau_p$	20 ns
Ions/length <sup>a</sup>	$N_i$	$10^{18}/\text{cm}$
Electron temperature	$T$	300 eV
Magnetic field (edge)	$B$	$\mu_0 I / 2\pi r$
Collisionality	$\omega_{pe} \tau_{ee}$	500
Drift velocity	$v_D$	$T / eN_e$ $10^7 \text{ cm/s}$





## D. Outlook

Allen, C. W. (1973). *Astrophysical Quantities*, 3rd ed. (Athlone, London).

Plazmy 10, 1051 (Sov. J. Plasma Phys. 10, 605).

Apdzieszko, J. L. and Davis, J. L. (1990). A Study of the Nonlinear Evolution of

Bateman, G. (1978). *MHD Instabilities* (MIT, Cambridge, MA).

Richardson, R., Riordan, J., and Wilkinson, M. (1983). "Imploding

Phys. Lett. 39, 849

Coppins, M., Bond, D. J., and Haines, M. G. (1984a). "On the Vlasov fluid

Schneider, R. (1970). "Y-spun line currents from Exploded Wire Accelerators,"

*International Conference on High Power Particle Beams*, University of

Renoult, E. M. and Heines, M. (1986) "Dissome transport coefficients in

Toroidal Neoclassical Orbits," *J. Nucl. Fusion*, 26, Y. A. 1, 31-50.

Moldin, A. I. and Vrabolov, I. Ya. (1985) "Superdense high temperature

Atomic Plasma," *Zh. OS*.

Fedor, D., Pacholski, J.S., Bielawski, T.G. and Gora, T.J. (1994) "CFD-1

PL-10-600

Magill, C. (1984) "A New Method for Calculating the Critical Current in Superconducting Wires," *Physica*, 121B, A. 191-195.

John Doe et al. vs. John Doe et al.

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