

تصميم عدسة الكترونية عديمة التشويه والدوران

Abstract

In this work, the doublet project magnetic lens with different pole pieces has been designed, which consists of two lenses; one is of a single cylindrical pole piece and the other of a double spherical pole piece. The radial and spiral distortions have been corrected by using this lens at low and high magnification regions, after the magnetic field has been computed.

(Al-Saady and Al-Shummary, 2004)

(Hawkes, 1972; Al-Saady, 2007)

$$\theta = 0.1863NI / Vr^{\frac{1}{2}}$$

$$V_r \left(- \right) NI$$

(Juma and Mulvey 1974, 1976, 1978) (NI₁ = -NI₂)

(1991)

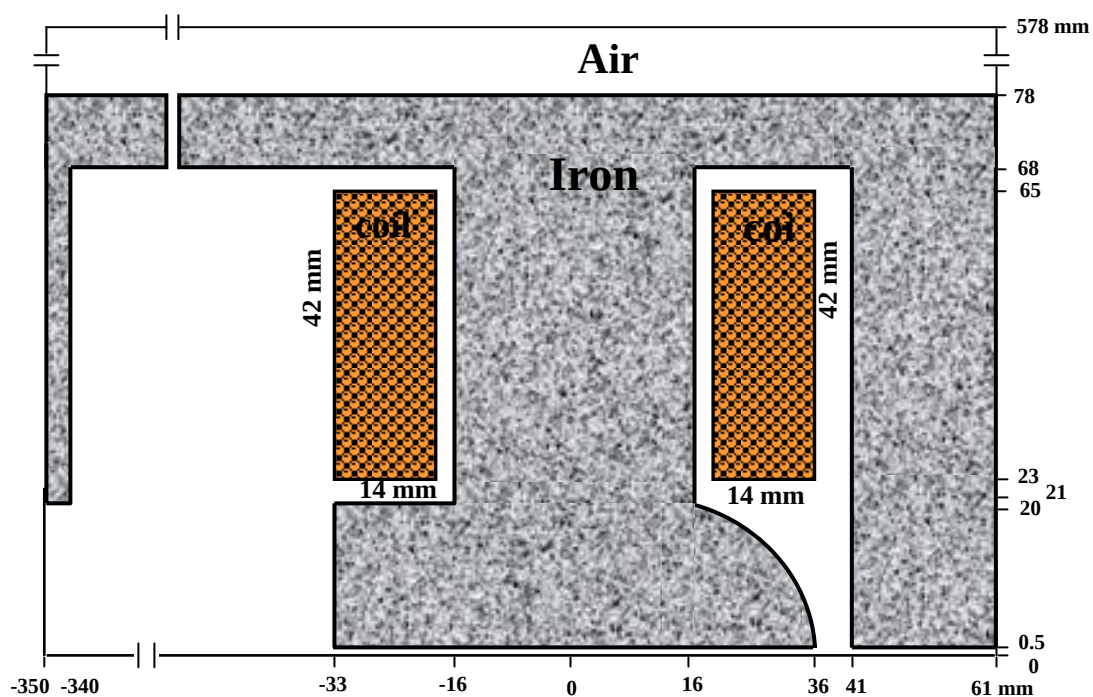
(Al-Saady et al, 1998)

(Al-Abedeen 1997)

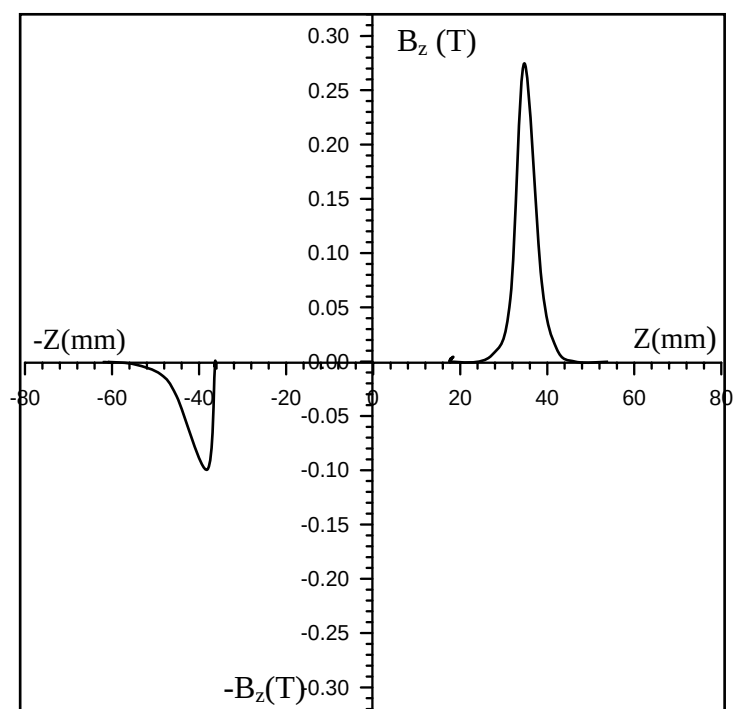
(Al-Saady, 2008)

(Al-Saady *et al* , 2005) (1)
 (Al-Abdeen, 1997)
 3 .
 .(Juma *et al* 1983)
 - 1000 = (NI)₁= -(NI)₂
 I₁ N₂ N₁
 I₂ .
 (Lencova 1988)
 (Finite element method FEM)
 (Marai 1977) (Munro 1971)
 .
 B_z (2)
 S=5mm
 D₁:D₂:D₃=2.5:1:1
 1mm 0.100 B_m
 B_m
 0.274
 (2)
 .
 (D_r) (F_p) (3)
 min . NI/V_r^{1/2} (D_s)
 NI/V_r^{1/2}=4 65.812 (F_p)
 .
 S D₁:D₂:D₃ (1)
 . (1)

$D_1:D_2:D_3=2.5:0.5:0.5$		$S=1.5mm$
(4)		
B_m		0.830
3	0.096	B_m
(4)		
D_r	E_p	(5)
	$NI/V_r^{1/2}$	D_s
	$NI/V_r^{1/2} = 15$	1.519
	$NI/V_r^{1/2}=17$	$(F_p)_{min}$
		$D_s \quad D_r$
:		
		.1
		.2
		.3
		.4



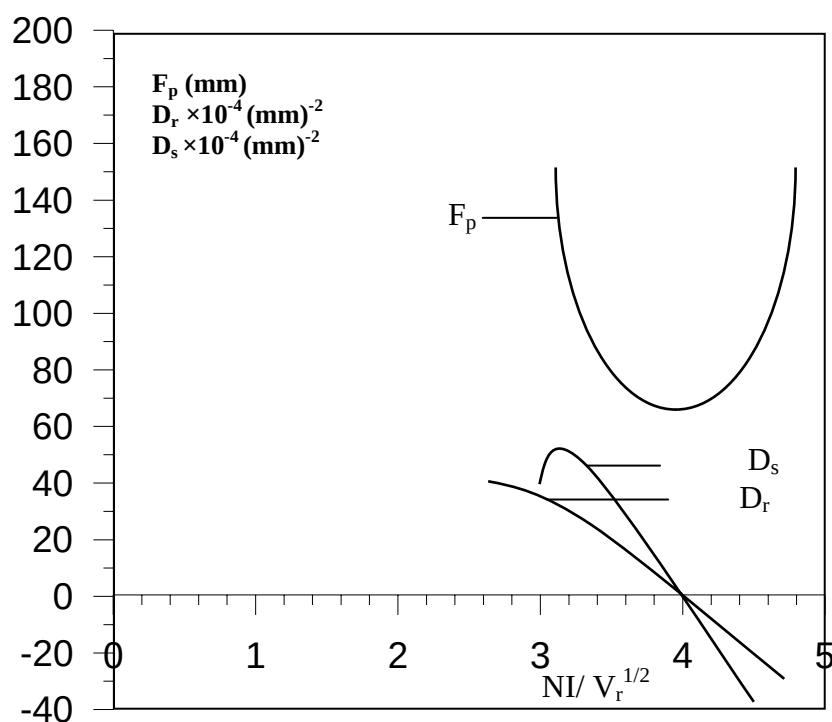
(1)



(2)

. $D_1:D_2:D_3=2.5:1:1$

$S=5\text{mm}$



(3)

D_s D_r F_p

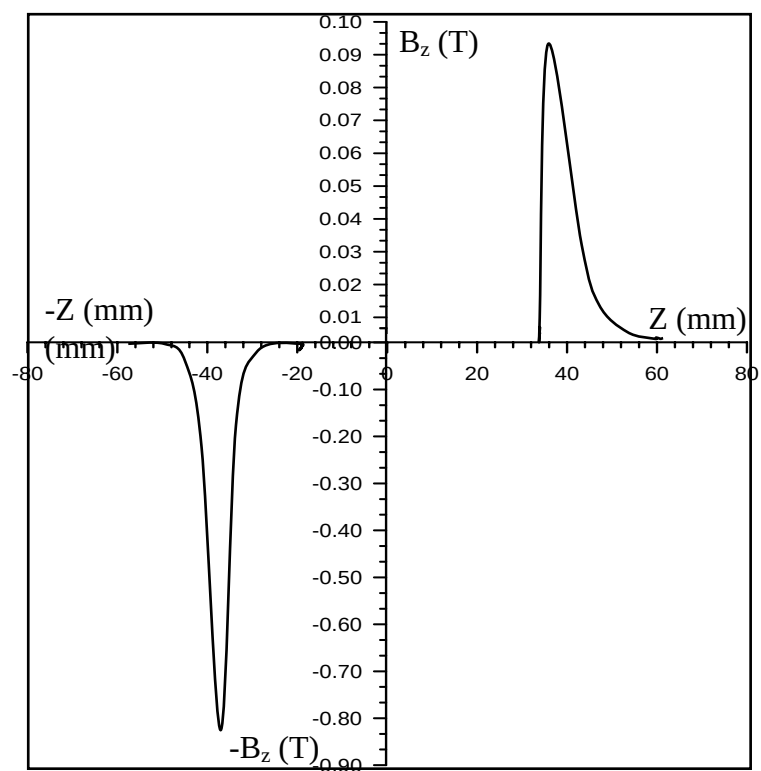
$NI/V_r^{1/2}$

(1)

S

$D_1:D_2:D_3$

$D_1:D_2:D_3$	S(mm)	(Fp)min (mm)	$NI/V_r^{1/2}$ at (Fp) min	$NI/V_r^{1/2}$ at $D_r = 0$	$NI/V_r^{1/2}$ at $D_s = 0$	Bm ₁ (T)	Bm ₂ (T)
2.5:1:1	5	65.812	4	4	4	0.100	0.274
2.3:1:1	4	60.564	4	4	4	0.101	0.342
4:1:1	3	55.749	4	4	4	0.098	0.404
4:1:1	2	49.001	4	4.5	4.5	0.098	0.512
6:1:1	1	43.662	4	4.5	4.5	0.099	0.555

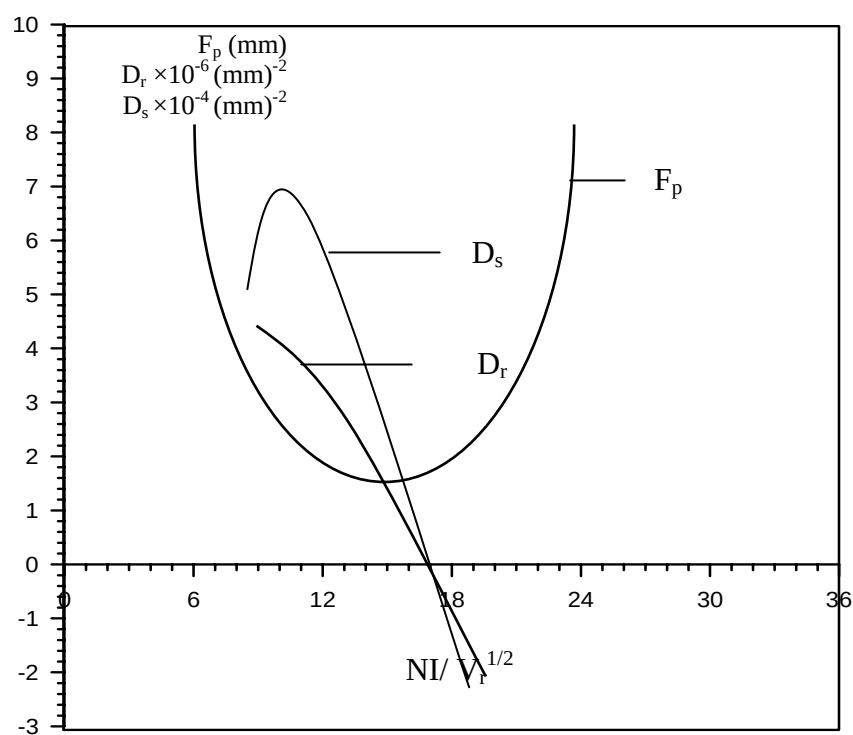


B_z

(4)

$D_1:D_2:D_3=2.5:0.5:0.5$

$S=1.5$ mm



D_s

D_r

F_p

(5)

$NI/V_r^{1/2}$

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