Anhang

Formel zur Berechnung des Tensorelementes N_{xixP} und N_{yixP}:

$$
\begin{aligned}
N_{xixP} = \frac{1}{4\pi}\Bigg[& \arctan \frac{\left(y_p - y_i - \frac{\Delta y_i}{2}\right)\cdot\left(x_p - x_i - \frac{\Delta z_i}{2}\right)}{\left(x_p - x_i - \frac{\Delta x_i}{2}\right)\sqrt{\left(x_p - x_i - \frac{\Delta x_i}{2}\right)^2 + \left(y_p - y_i - \frac{\Delta y_i}{2}\right)^2 + \left(z_p - z_i - \frac{\Delta z_i}{2}\right)^2}} \\
& - \arctan \frac{\left(y_p - y_i - \frac{\Delta y_i}{2}\right)\cdot\left(x_p - x_i + \frac{\Delta z_i}{2}\right)}{\left(x_p - x_i - \frac{\Delta x_i}{2}\right)\sqrt{\left(x_p - x_i - \frac{\Delta x_i}{2}\right)^2 + \left(y_p - y_i - \frac{\Delta y_i}{2}\right)^2 + \left(z_p - z_i + \frac{\Delta z_i}{2}\right)^2}} \\
& - \arctan \frac{\left(y_p - y_i + \frac{\Delta y_i}{2}\right)\cdot\left(x_p - x_i - \frac{\Delta z_i}{2}\right)}{\left(x_p - x_i - \frac{\Delta x_i}{2}\right)\sqrt{\left(x_p - x_i - \frac{\Delta x_i}{2}\right)^2 + \left(y_p - y_i + \frac{\Delta y_i}{2}\right)^2 + \left(z_p - z_i - \frac{\Delta z_i}{2}\right)^2}} \\
& + \arctan \frac{\left(y_p - y_i + \frac{\Delta y_i}{2}\right)\cdot\left(x_p - x_i + \frac{\Delta z_i}{2}\right)}{\left(x_p - x_i - \frac{\Delta x_i}{2}\right)\sqrt{\left(x_p - x_i - \frac{\Delta x_i}{2}\right)^2 + \left(y_p - y_i + \frac{\Delta y_i}{2}\right)^2 + \left(z_p - z_i + \frac{\Delta z_i}{2}\right)^2}} \\
& - \arctan \frac{\left(y_p - y_i - \frac{\Delta y_i}{2}\right)\cdot\left(x_p - x_i - \frac{\Delta z_i}{2}\right)}{\left(x_p - x_i + \frac{\Delta x_i}{2}\right)\sqrt{\left(x_p - x_i + \frac{\Delta x_i}{2}\right)^2 + \left(y_p - y_i - \frac{\Delta y_i}{2}\right)^2 + \left(z_p - z_i - \frac{\Delta z_i}{2}\right)^2}} \\
& + \arctan \frac{\left(y_p - y_i - \frac{\Delta y_i}{2}\right)\cdot\left(x_p - x_i + \frac{\Delta z_i}{2}\right)}{\left(x_p - x_i + \frac{\Delta x_i}{2}\right)\sqrt{\left(x_p - x_i + \frac{\Delta x_i}{2}\right)^2 + \left(y_p - y_i - \frac{\Delta y_i}{2}\right)^2 + \left(z_p - z_i + \frac{\Delta z_i}{2}\right)^2}} \\
& + \arctan \frac{\left(y_p - y_i + \frac{\Delta y_i}{2}\right)\cdot\left(x_p - x_i - \frac{\Delta z_i}{2}\right)}{\left(x_p - x_i + \frac{\Delta x_i}{2}\right)\sqrt{\left(x_p - x_i + \frac{\Delta x_i}{2}\right)^2 + \left(y_p - y_i + \frac{\Delta y_i}{2}\right)^2 + \left(z_p - z_i - \frac{\Delta z_i}{2}\right)^2}} \\
& - \arctan \frac{\left(y_p - y_i + \frac{\Delta y_i}{2}\right)\cdot\left(x_p - x_i + \frac{\Delta z_i}{2}\right)}{\left(x_p - x_i + \frac{\Delta x_i}{2}\right)\sqrt{\left(x_p - x_i + \frac{\Delta x_i}{2}\right)^2 + \left(y_p - y_i + \frac{\Delta y_i}{2}\right)^2 + \left(z_p - z_i + \frac{\Delta z_i}{2}\right)^2}} \Bigg]
\end{aligned}
$$

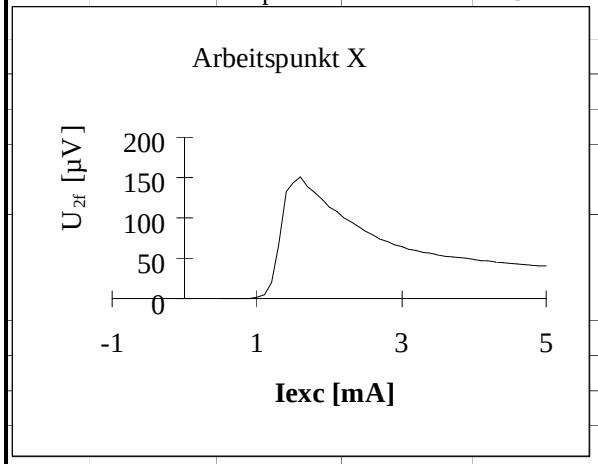
Formel zur Berechnung des Tensorelementes N_{yixP}:

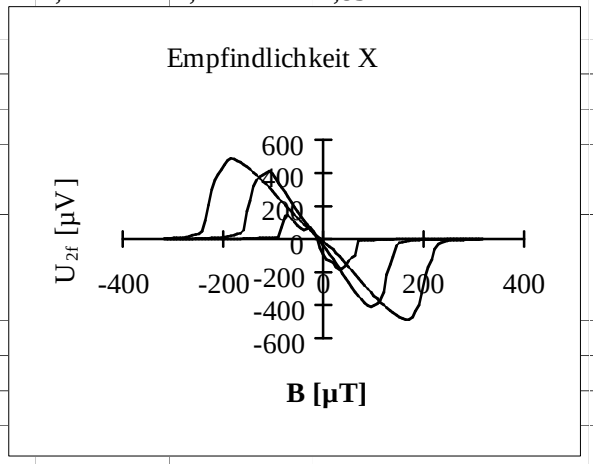
$$
\begin{aligned}
N_{yixP} = \frac{1}{4\pi}\Bigg[& -\ln\left(z_p - z_i - \frac{\Delta z_i}{2} + \sqrt{\left(x_p - x_i - \frac{\Delta x_i}{2} \right)^2 + \left(y_p - y_i - \frac{\Delta y_i}{2} \right)^2 + \left(z_p - z_i - \frac{\Delta z_i}{2} \right)^2} \right) \\
& + \ln\left(z_p - z_i - \frac{\Delta z_i}{2} + \sqrt{\left(x_p - x_i - \frac{\Delta x_i}{2} \right)^2 + \left(y_p - y_i + \frac{\Delta y_i}{2} \right)^2 + \left(z_p - z_i - \frac{\Delta z_i}{2} \right)^2} \right) \\
& + \ln\left(z_p - z_i - \frac{\Delta z_i}{2} + \sqrt{\left(x_p - x_i - \frac{\Delta x_i}{2} \right)^2 + \left(y_p - y_i - \frac{\Delta y_i}{2} \right)^2 + \left(z_p - z_i + \frac{\Delta z_i}{2} \right)^2} \right) \\
& - \ln\left(z_p - z_i - \frac{\Delta z_i}{2} + \sqrt{\left(x_p - x_i - \frac{\Delta x_i}{2} \right)^2 + \left(y_p - y_i + \frac{\Delta y_i}{2} \right)^2 + \left(z_p - z_i + \frac{\Delta z_i}{2} \right)^2} \right) \\
& + \ln\left(z_p - z_i - \frac{\Delta z_i}{2} + \sqrt{\left(x_p - x_i + \frac{\Delta x_i}{2} \right)^2 + \left(y_p - y_i - \frac{\Delta y_i}{2} \right)^2 + \left(z_p - z_i - \frac{\Delta z_i}{2} \right)^2} \right) \\
& - \ln\left(z_p - z_i - \frac{\Delta z_i}{2} + \sqrt{\left(x_p - x_i + \frac{\Delta x_i}{2} \right)^2 + \left(y_p - y_i + \frac{\Delta y_i}{2} \right)^2 + \left(z_p - z_i - \frac{\Delta z_i}{2} \right)^2} \right) \\
& - \ln\left(z_p - z_i - \frac{\Delta z_i}{2} + \sqrt{\left(x_p - x_i + \frac{\Delta x_i}{2} \right)^2 + \left(y_p - y_i - \frac{\Delta y_i}{2} \right)^2 + \left(z_p - z_i + \frac{\Delta z_i}{2} \right)^2} \right) \\
& + \ln\left(z_p - z_i - \frac{\Delta z_i}{2} + \sqrt{\left(x_p - x_i + \frac{\Delta x_i}{2} \right)^2 + \left(y_p - y_i + \frac{\Delta y_i}{2} \right)^2 + \left(z_p - z_i + \frac{\Delta z_i}{2} \right)^2} \right) \Bigg]
\end{aligned}
$$

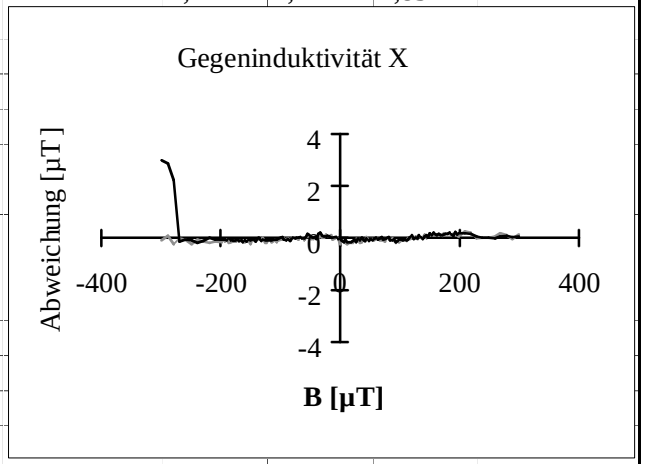
Magnetisches Vektorpotential eines rechteckförmigen Leiters in z-Richtung:

$$
\begin{aligned}
V_y = -\frac{\mu}{8\cdot\pi}\cdot\frac{I}{b\cdot h}\Bigg\{ & -3\cdot h\cdot b + \\
& + \left(z-\frac{b}{2}\right)^2\cdot\left(\arctan\frac{x-\frac{h}{2}}{z-\frac{b}{2}} - \arctan\frac{x+\frac{h}{2}}{z-\frac{b}{2}}\right) - \left(z+\frac{b}{2}\right)^2\cdot\left(\arctan\frac{x+\frac{h}{2}}{z+\frac{b}{2}} - \arctan\frac{x-\frac{h}{2}}{z+\frac{b}{2}}\right) + \\
& + \left(x-\frac{h}{2}\right)^2\cdot\left(\arctan\frac{z-\frac{b}{2}}{x-\frac{h}{2}} - \arctan\frac{z+\frac{b}{2}}{x-\frac{h}{2}}\right) - \left(x+\frac{h}{2}\right)^2\cdot\left(\arctan\frac{z+\frac{b}{2}}{x+\frac{h}{2}} - \arctan\frac{z-\frac{b}{2}}{x+\frac{h}{2}}\right) + \\
& + \left(x-\frac{h}{2}\right)\cdot\left(z-\frac{b}{2}\right)\cdot\ln\left[\left(x-\frac{h}{2}\right)^2+\left(z-\frac{b}{2}\right)^2\right] + \left(x-\frac{h}{2}\right)\cdot\left(z+\frac{b}{2}\right)\cdot\ln\left[\left(x-\frac{h}{2}\right)^2+\left(z+\frac{b}{2}\right)^2\right] \\
& - \left(x+\frac{h}{2}\right)\cdot\left(z-\frac{b}{2}\right)\cdot\ln\left[\left(x+\frac{h}{2}\right)^2+\left(z-\frac{b}{2}\right)^2\right] - \left(x+\frac{h}{2}\right)\cdot\left(z+\frac{b}{2}\right)\cdot\ln\left[\left(x+\frac{h}{2}\right)^2+\left(z+\frac{b}{2}\right)^2\right] \Bigg\}
\end{aligned}
$$

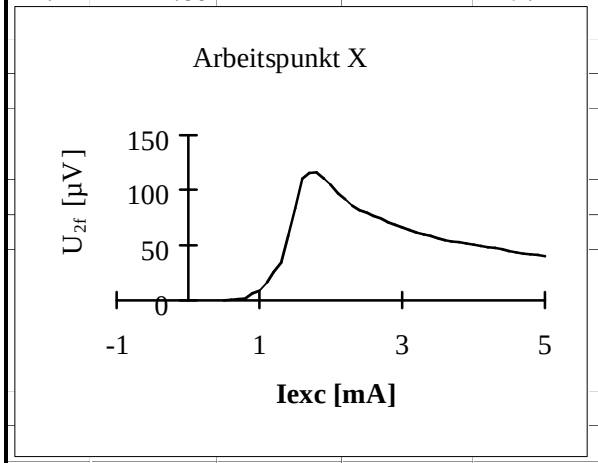
Wafer:	VC576/06	Chip / SC:	28 / 5	I_{EXC} =	1,41 mA	2,12 mA	2,83 mA	I_{EXC} =	1,41 mA	2,12 mA	2,83 mA

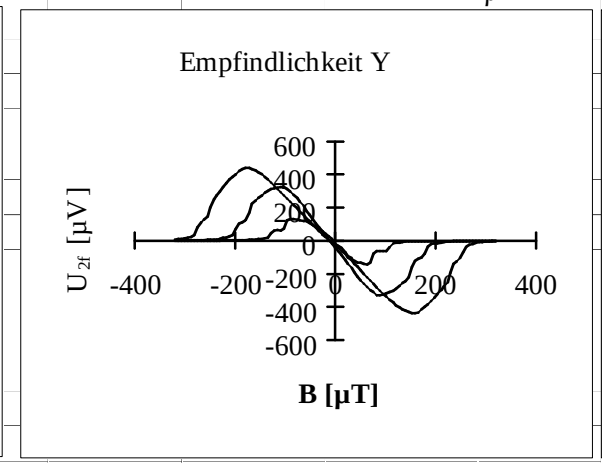


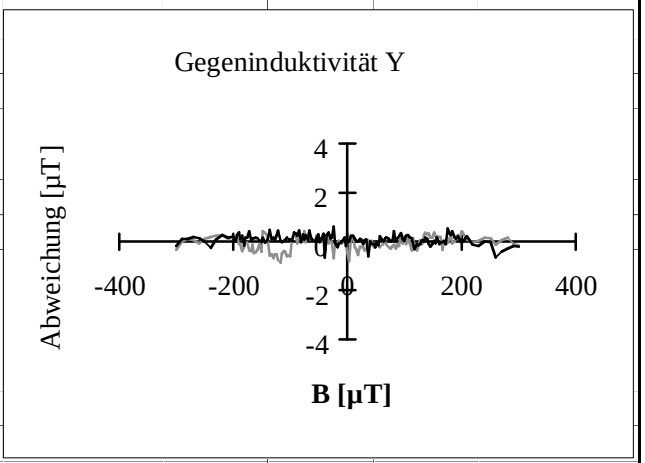




U_{Max}:	150.40	µV	U_{Max}:	164.52	410.14	487.89	µV	K_X [µT/mA] :	79.67	79.38	78.58	µT/mA
S_{Max}:	0.30	V/(kHz*T)	S_{Max}:	0.20	0.21	0.15	V/(kHz*T)					
I_{Exc}:	1.60	mA	B_{Max}:	50.83	101.63	174.57	µT					



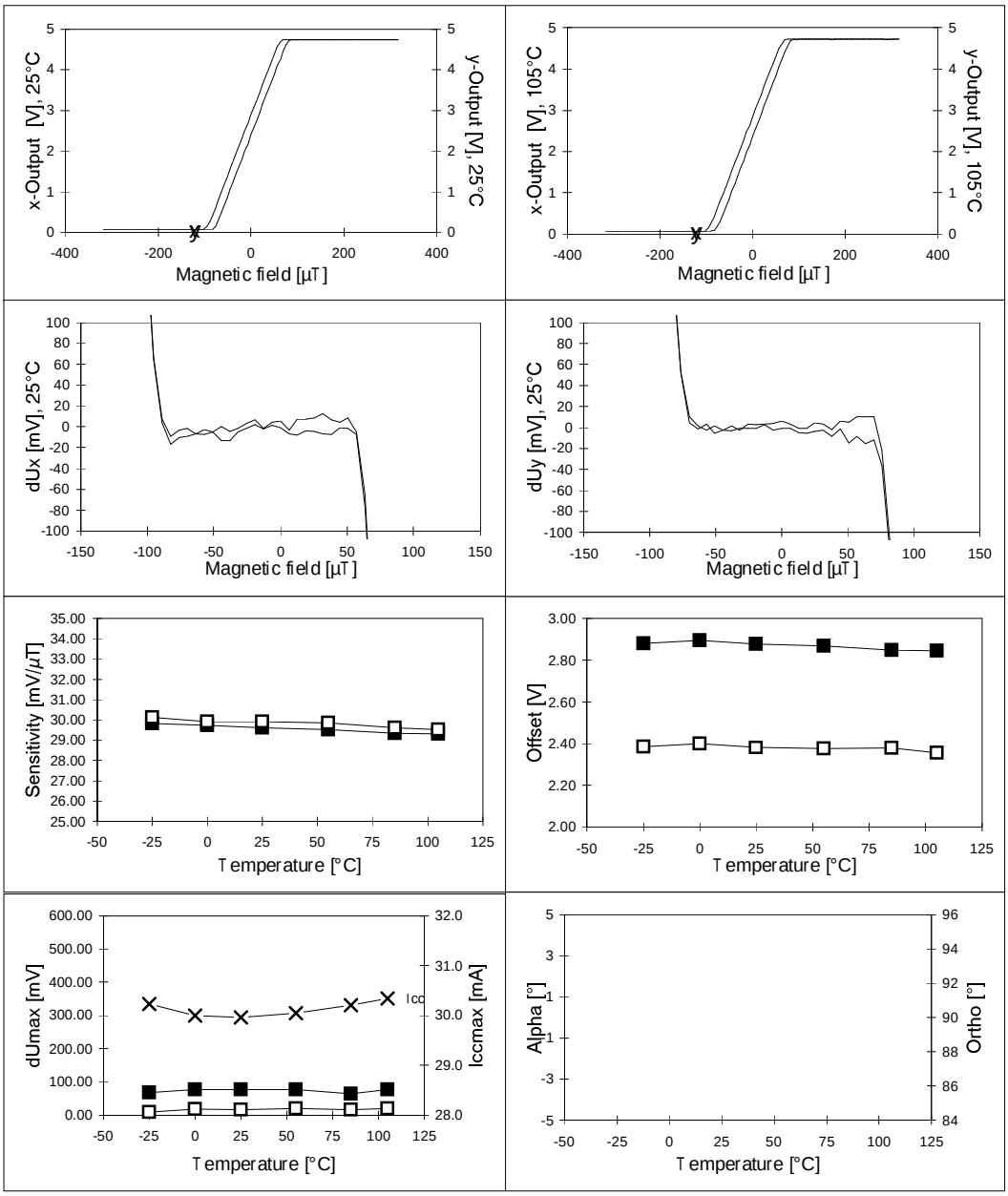




U_{Max}:	116.23	µV	U_{Max}:	137.19	327.05	438.99	µV	K_Y [µT/mA] :	80.35	79.50	79.16	µT/mA
S_{Max}:	0.23	V/(kHz*T)	S_{Max}:	0.13	0.19	0.15	V/(kHz*T)					
I_{Exc}:	1.80	mA	B_{Max}:	76.68	99.05	169.22	µT					

Typ: **FGS1** Charge: **VII** No: **9C4** A-Chip: 3C SC: 17
COB05 (16 mm x 16 mm) File: S-Chip: V11 SC: 23

T	Ucc	U0x		Fx		dUx		Linx	U0y		Fy		dUy		Liny	Icc		Fx/Fy		a		or
°C	V	V		V/mT		mV		µT	V		V/mT		mV		µT	mA		[ ]		[ ]		[ ]
-40	5.00																					
-25	5.00	2.88		29.81	x	68.2	x	0	2.3858	x	30.11	x	10.6	x	0	30.2	x	0.990	x			
0	5.00	2.89		29.75	x	78.2	x	0	2.3988	x	29.90	x	17.9	x	0	30.0	x	0.995	x			
25	5.00	2.88		29.61	x	76.5	x	0	2.3806	x	29.91	x	15.6	x	0	30.0	x	0.990	x			
55	5.00	2.87		29.53	x	76.1	x	0	2.3755	x	29.86	x	19.5	x	0	30.0	x	0.989	x			
85	5.00	2.85		29.35	x	65.6	x	0	2.3790	x	29.61	x	16.2	x	0	30.2	x	0.991	x			
105	5.00	2.84		29.30	x	75.7	x	0	2.3558	x	29.54	x	19.5	x	0	30.3	x	0.992	x			
Max	5.00	0.049		0.509					0.043		0.568					0.381		0.006				
Rel %	5.00	1.697		1.720					1.806		1.898					1.272		0.575				
Tk	5.00	130.53		132.328		16.579			138.90		145.964							44.247				
-25	4.75	2.75		29.66	x	127.8	x	0	2.28	x	30.00	x	10.3	x	0	16.6		0.989	x			
-25	5.25	3.01		29.85	x	27.6	x	0	2.50	x	30.02	x	18.1	x	0	18.8		0.994	x			
25	4.75	2.73		29.30	x	104.0	x	0	2.24	x	29.68	x	18.4	x	0	16.8		0.987	x			
25	5.25	3.01		29.71	x	35.7	x	0	2.51	x	29.93	x	14.2	x	0	18.9		0.992	x			
105	4.75	2.71		28.95	x	110.6	x	0	2.22	x	29.15	x	15.6	x	0	17.2		0.993	x			
105	5.25	2.97		29.35	x	37.8	x	0	2.49	x	29.70	x	18.2	x	0	19.2		0.988	x			



■ x □ y