



TRANSMISSION OF Au<sup>50+</sup>

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THE TRANSMISSION OF  $\text{Au}^{50+}$

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With the code RFI (Radio Frequency for Ions), similar to MATCH and RAMA, the transmission (TRAN; separate for each phase) of  $\text{Au}^{50+}$  for the new scenario was computed, for  $\text{N}_2$  equ. pressure of  $10^{-9}$  torr ( $\sim 10^{-8}$  total pressure).

At each h-change the programme assumes a blow-up of  $\epsilon_1$  of a factor 2.

Note that  $Q_s$  is limited to  $\leq 0.16$  - due to space charge (probably not included in Ruggiero's code).

1.E-9 Torr, h Chang, 197 AU 50+

	Acc.	h	Chang	Acc.	2nd h-Chang	Acc.
RADIUS (M)	40.7440	40.7440	40.7440	40.7440	40.7440	40.7440
BEND. RADIUS (M)	16.8700	16.8700	16.8700	16.8700	16.8700	16.8700
GAMMA (TRANS)	4.6090	4.6090	4.6090	4.6090	4.6090	4.6090
HARMONIC NR	180.0000	-90.0000	90.0000	90.0000	-45.0000	45.0000
QX	4.7700	4.7700	4.7700	4.7700	4.7700	4.7700
QZ	4.7600	4.7600	4.7600	4.7600	4.7600	4.7600
CHAMBER W. (M)	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650
CHAMBER H. (M)	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400
Z/N (OHM)	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
TRISE (USEC)	-0.0077	0.0001	-0.0064	0.0001	0.0001	0.0500
VRF (V)	0.1300E+07	0.1300E+07	0.1300E+07	0.1300E+07	0.1300E+07	0.1300E+07
EPS1 (IMAGE C)	0.1300	0.1300	0.1300	0.1300	0.1300	0.1300
EPS2 (Z)	0.4100	0.4100	0.4100	0.4100	0.4100	0.4100
A.T. MASS	197.0000	197.0000	197.0000	197.0000	197.0000	197.0000
CHARGE C	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
G(Z) (FORM. F.)	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000
GAP HEIGHT (M)	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400
H/NR OF BUNCHES	4.0000	2.0000	2.0000	2.0000	1.0000	1.0000
RISE/FALL TIME	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
NR OF PROTONS	0.2700E+10	0.2700E+10	0.2700E+10	0.2700E+10	0.2700E+10	0.2700E+10
MAX. DISPERS.	0.5000E+01	0.5000E+01	0.5000E+01	0.5000E+01	0.5000E+01	0.5000E+01
MIN. DISPERS.	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TUNG (EV)	0.4220E+07	0.1760E+08	0.1760E+08	0.1760E+08	0.8000E+08	0.8000E+08
VACUUM (Torr)	0.1000E-08	0.1000E-08	0.1000E-08	0.1000E-08	0.1000E-08	0.1000E-08
FINL T (EV)	0.9315E+09	0.7900E+02	0.7000E+01	0.7000E+01	0.0000E+00	0.1000E+10
Amu,Z1,Z2,Method	0.0000E+00	AMU '0.931502E+09				
PART. CURRENT (A)	0.8000E-05					
EXR (E MR)	0.8000E-05					
EZR (E MR)	0.8000E-05					
EL (EV-S)	0.000400					

AFAC 1.000000

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EL.Exn,Exn = 0.0004 8.0 8.0 EL(mrad) = 0.57 197 Au 50+ EL(mrad) = 0.57

ACC. 1	B(T)	FRF(MC)	VRf(kV)	PHIS	Amrd	A(eVs)	EX	EZ	PHIM	LB/2	BUF	-DQX	-DQZ	-DQZI	dp/p%	Qs	Qs/Qs0	SRKC	tau	TRAN	TIME
0.004	0.069	20.00	-14.9	0.0	0.7	0.000	83.9	83.9	144.2	0.57	462	0.099	154	.011	0.075	0.0674	0.61	0.7550	204	1.00	0.0
0.005	0.078	22.54	87.4	27.3	0.7	0.000	74.4	74.4	82.8	0.33	283	0.124	218	.014	0.116	0.1597	0.72	0.8760	281	1.00	1.0
0.007	0.087	25.07	87.8	27.2	0.7	0.000	66.8	66.8	83.1	0.33	284	0.114	194	.012	0.104	0.1420	0.71	0.8760	369	0.99	1.9
0.008	0.096	27.59	88.1	27.0	0.7	0.000	60.6	60.6	83.4	0.33	285	0.106	174	.009	0.094	0.1277	0.70	0.8750	465	0.99	2.9
0.010	0.105	30.10	88.4	26.9	0.7	0.000	55.5	55.5	83.6	0.33	286	0.099	158	.008	0.086	0.1158	0.69	0.8750	602	0.99	3.8
0.011	0.114	32.59	88.7	26.9	0.7	0.000	51.1	51.1	83.8	0.33	286	0.093	145	.007	0.079	0.1059	0.69	0.8750	767	0.99	4.8
0.013	0.122	35.08	88.9	26.8	0.7	0.000	47.4	47.4	84.0	0.33	287	0.087	134	.006	0.073	0.0975	0.68	0.8740	936	0.99	5.7
0.015	0.131	37.54	89.1	26.7	0.7	0.000	44.2	44.2	84.2	0.33	287	0.082	124	.005	0.068	0.0902	0.68	0.8741	104	0.99	6.7
0.017	0.140	39.99	89.2	26.7	0.7	0.000	41.4	41.4	84.3	0.33	288	0.078	115	.004	0.064	0.0838	0.67	0.8741	262	0.99	7.7

1st Change EL.Exn,Exn = 0.0008 8.0 8.0 EL(mrad) = 0.57

ACC. 2	B(T)	FRF(MC)	VRf(kV)	PHIS	Amrd	A(eVs)	EX	EZ	PHIM	LB/2	BUF	-DQX	-DQZ	-DQZI	dp/p%	Qs	Qs/Qs0	SRKC	tau	TRAN	TIME
0.017	0.140	20.00	136.8	50.7	0.3	0.000	41.4	41.4	49.9	0.39	171	0.068	097	.004	0.054	0.0590	0.64	0.9051	262	1.00	7.7
0.022	0.160	22.68	136.9	50.7	0.3	0.000	36.3	36.3	50.1	0.40	172	0.061	084	.003	0.047	0.0509	0.63	0.9051	566	1.00	8.5
0.025	0.180	25.32	137.0	50.6	0.3	0.000	32.3	32.3	50.2	0.40	172	0.055	074	.002	0.042	0.0446	0.62	0.9051	798	1.00	9.3
0.034	0.199	27.91	137.0	50.6	0.3	0.000	29.1	29.1	50.2	0.40	172	0.050	066	.002	0.038	0.0395	0.62	0.9041	968	1.00	10.1
0.041	0.219	30.44	137.0	50.6	0.3	0.000	26.5	26.5	50.2	0.40	172	0.046	060	.001	0.034	0.0354	0.61	0.9042	092	1.00	10.9
0.049	0.239	32.92	136.9	50.7	0.3	0.000	24.3	24.3	50.2	0.40	172	0.042	054	.001	0.031	0.0320	0.60	0.9042	186	1.00	11.7
0.057	0.258	35.34	136.8	50.7	0.3	0.000	22.5	22.5	50.2	0.40	172	0.039	050	.001	0.029	0.0291	0.60	0.9042	258	1.00	12.5
0.066	0.278	37.70	136.7	50.8	0.3	0.000	20.9	20.9	50.1	0.40	172	0.036	046	.001	0.027	0.0266	0.59	0.9042	317	1.00	13.2
0.075	0.298	39.99	136.5	50.9	0.3	0.000	19.5	19.5	50.0	0.40	171	0.034	042	.001	0.025	0.0245	0.59	0.9042	368	1.00	14.1

2nd Change EL.Exn,Exn = 0.0016 8.0 8.0 EL(mrad) = 0.57

ACC. 3	B(T)	FRF(MC)	VRf(kV)	PHIS	Amrd	A(eVs)	EX	EZ	PHIM	LB/2	BUF	-DQX	-DQZ	-DQZI	dp/p%	Qs	Qs/Qs0	SRKC	tau	TRAN	TIME
0.090	0.327	21.63	200.0	43.3	1.5	0.004	17.8	17.8	39.3	0.62	142	0.015	023	.000	0.059	0.0319	0.92	0.9562	432	0.97	15.0
0.200	0.501	29.93	200.0	53.7	0.9	0.002	11.6	11.6	39.4	0.62	139	0.009	014	.000	0.038	0.0173	0.90	0.9312	748	0.97	20.0
0.357	0.694	36.41	200.0	57.9	0.8	0.002	8.4	8.4	37.2	0.59	130	0.007	009	.000	0.029	0.0108	0.88	0.9233	152	0.97	25.0
0.539	0.867	40.78	184.3	61.0	0.7	0.002	6.5	6.5	35.7	0.56	123	0.005	007	.000	0.024	0.0070	0.87	0.9153	605	0.97	30.0
0.715	1.061	43.49	155.3	62.0	0.7	0.002	5.5	5.5	34.4	0.54	119	0.004	005	.000	0.021	0.0048	0.85	0.9164	047	0.97	35.0
0.867	1.199	45.08	113.2	61.6	0.7	0.002	4.8	4.8	35.0	0.55	121	0.003	004	.000	0.018	0.0034	0.83	0.9154	415	0.97	40.0
0.966	1.288	45.91	80.0	40.9	2.9	0.008	4.5	4.5	30.4	0.48	111	0.003	004	.000	0.019	0.0032	0.84	0.9754	657	0.97	45.0
1.000	1.318	46.16	40.0	0.0	10.5	0.029	4.4	4.4	33.3	0.53	123	0.003	003	.000	0.017	0.0025	0.83	0.9834	742	0.97	50.0

Column Headings :

- Phis = stable phase angle
- A(eVs) = Bucket Area (also given in mrad)
- Ex,Ez = Physical Emittances in pi mm mrad
- LB/2 = in m
- BUF = bunching factor (I average / I peak)
- DQX,z = Max. Space-Charge Tune shift
- dp/p = (dair) bunch height
- Qs = synchrotron tune
- srkt = kt = Qs/Qso where Qso = zero intensity tune
- srkc = kc = tune of rigid dipole mode / Qso
- kt, kc Cf. Hofmann & Pedersen, IEEE NS-26, 3526 (1979)
- tau = ion lifetime [s] due to charge exchange in res. gas
- TRAN = Transmission (begins with 1 with each machine or stage
- Time = [ms]