

Q20/Q26 and Transition

2012-03-05

Contents

Scope

B-dot, T_c , α_p

Beam loading

Scope

Not discussed

- ▶ dp/p and dQ : resonance crossing
- ▶ longitudinal space charge
 - ▶ defocussing/focussing
 - ▶ microwave/negative mass instability
- ▶ transverse space charge, Umstaetter effect
- ▶ head-tail (sign of Q')

Discussed

- ▶ B-dot, T_c , α_p
- ▶ beam loading

B-dot, T_c , α_p

	Q20	Q26
γ_t	17.95	23.26
t_t [ms]	156.8	220.0
$p(t_t)$ [GeV/c]	16.83	21.76
$\dot{B}(t_t)$ [T/s]	0.25	0.44
$T_{c,rel}$ [So]	47.1	66.2
$T_{c,rel}$ [Ng]	0.25	0.29

- ▶ $\dot{B}(t_t)$ 44% smaller for Q20
- ▶ T_c [So] 29% shorter for Q20
- ▶ T_c [Ng] 14% shorter for Q20
- ▶ horiz. aperture limit at γ_t : $\alpha_p = 1/\gamma_t^2$

Beam loading I

- ▶ transient beam loading, see Boussard et al
- ▶ beam loading angle for $f_{RF}(\gamma_t) \neq f_0$

TWC 200 MHz

γ	f_{RF} [MHz]	α_{bl}		
		3 Sections	4 Sections	5 Sections
17.95	200.085	-6.9°	-9.3°	-11.7°
22.30	200.195	-1.4°	-1.8°	-2.3°
24.00	200.222	-0.0°	-0.0°	-0.0°

TWC 800 MHz

γ	f_{RF} [MHz]	α_{bl}
		3 Sections
17.95	4×200.085	-21.6°
22.30	4×200.195	-4.3°
24.00	4×200.222	-0.0°

Beam loading II

twoArrows.nb v00.00; 2012-03-06 11:16:36; \$f76526

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