

Presentation 15

Accumulated current versus vertical tune

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In this experiment beam was accumulated up to saturation for different vertical tunes. Synchro-betatron resonances can limit this current. In the figure such a resonance is shown with $Q_y \approx 2Q_s$, (Q_s was measured to be 0.083). On the left side the maximum current is plotted against the *measured* betatron tune, i.e. the *coherent* tune. The incoherent tune cannot be measured directly but has to be calculated from the betatron tune shift caused by the reactive transverse impedance measured in other experiments to be about $dQ_{y-coh}/dI_b = -0.12 \text{ (mA/bunch)}^{-1}$. On the right side of the figure the accumulated current is plotted against this incoherent tune. The resonance looks more symmetrical in this case than in the plot against the coherent tune. This would indicate that the synchro-betatron resonances in LEP are incoherent phenomena. However, other measurements of the beam blow-up at a synchro-betatron resonance indicated more a coherent effect. This was supported by the observation of some coherent signals at the same time. The situation is not clear and more experiments will be necessary.

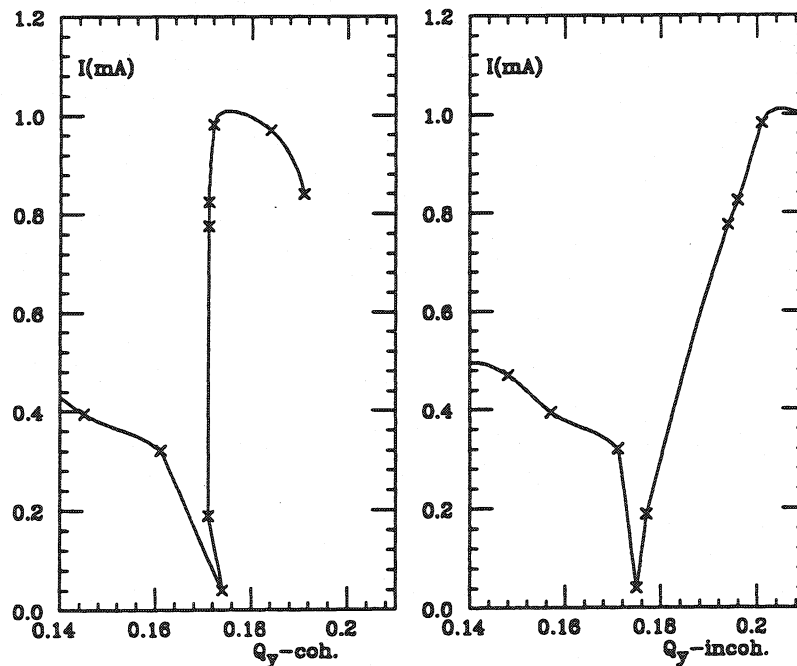


Figure 15.1: Max. current in 4 bunches vs. coherent and incoherent tunes