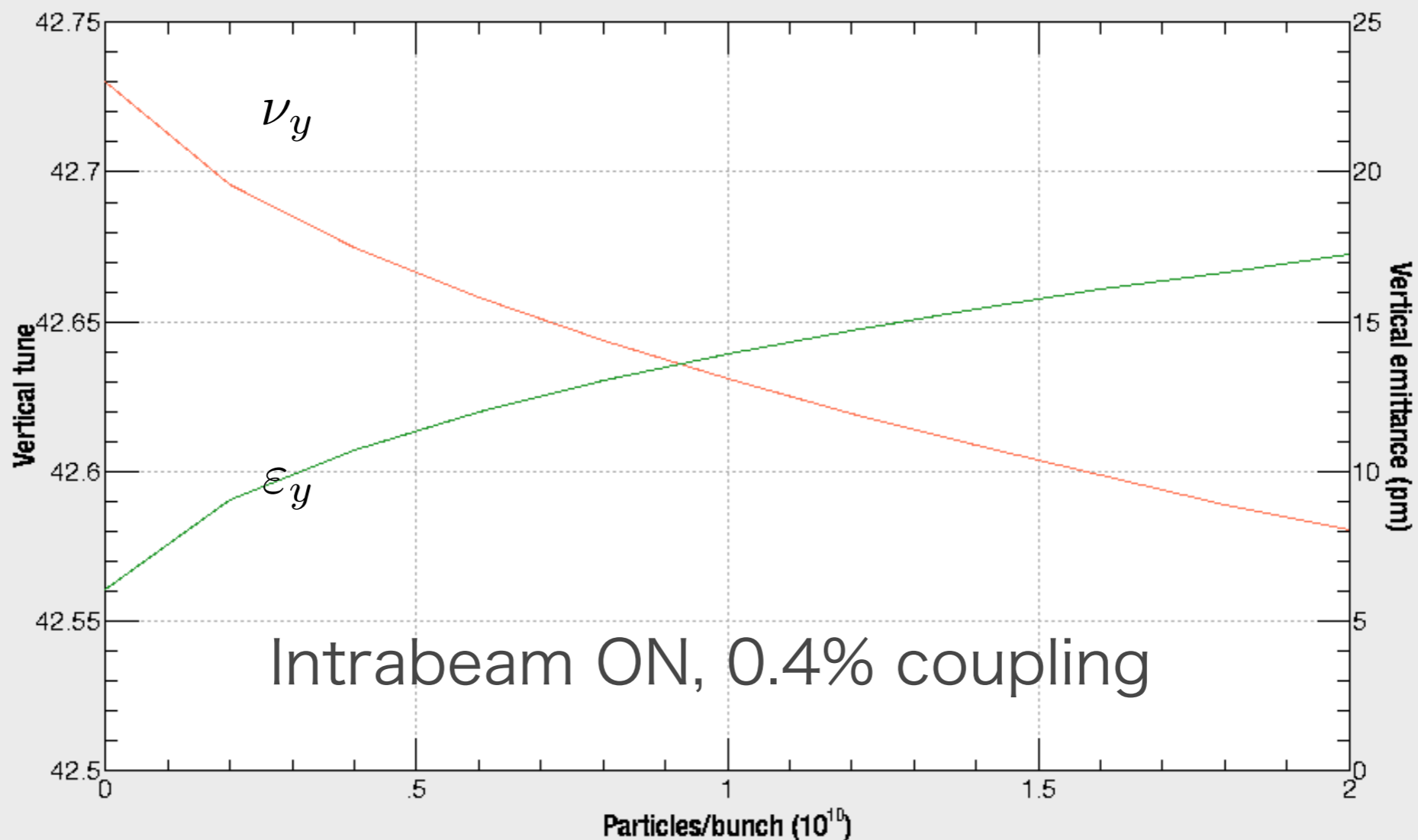

SPACE CHARGE + INTRABEAM

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Vertical tune shift by space charge is huge.

- * $\Delta\nu_y \approx 0.035$ @ $N = 2 \times 10^9$ for 0.4% coupling.
- * Relaxed by intrabeam scattering at high intensity.
- * At high intensity, the tune space will be limited.
- * Beta beat due to space charge may be OK unless tune is close to a half integer.



Beta beat with space charge @ $N=2 \cdot 10^{10}$

* $\Delta\beta_y/\beta_y \lesssim 8\%$ @ $N = 2 \times 10^{10}$.

* The reason for the strange pattern is not identified yet.

