

Preliminary analysis for wire scans from 30.07.04

Shown below are plots of the wire scanners calibration and the emittance changes during various stages of each cycle.

1) Scanner calibration

Times 1: measurements at 0.4 secs with both scanners

Times 2: measurements at later times (either at 1.1, 1.3, 1.5, 1.7 or 3.9 secs) with both scanners

Differences in the core emittances are smallest at both sets of times.

Differences in emittances are larger at the 2nd set of times

2) Rates of Emittance change in the different cycles

Rate at ramp = emittance change from 0.4secs to 1.1secs/time difference

Rate at early flat-top = rate of change from 1.1 to 1.4secs

Rate at late flat-top = rate of change from 1.4 to 3.9secs

The core emittance rate of change plot makes the most sense of all the emittance change rate measurements. With either BBLRs on or both off, the rate is small (nearly consistent with zero) during the ramp and the late flat-top. During the early flat top, there is emittance decrease, even with the BBLRS off or both on. However there is a significantly larger rate of decrease in the early flat-top when only BBLR1 is on.

The total emittance rate change plots are similar with BBLRs on or both off. However the data with BBLR1 on only doesn't make much sense during the early flat-top.

The error bars are also huge at the early flat top.

Perhaps the total emittance fits are not so reliable - the beams are very non-gaussian

The tail emittance plots also show that there is emittance reduction during the early flat-top with BBLRs on or off. With only BBLR1 on, the emittance rate change is slightly larger.

This seems to imply that the shaving in the tails is only slightly more with BBLR1 on.

Have there been independent measurements of the emittance evolution at 26 GeV (in the absence of wires) before these measurements?

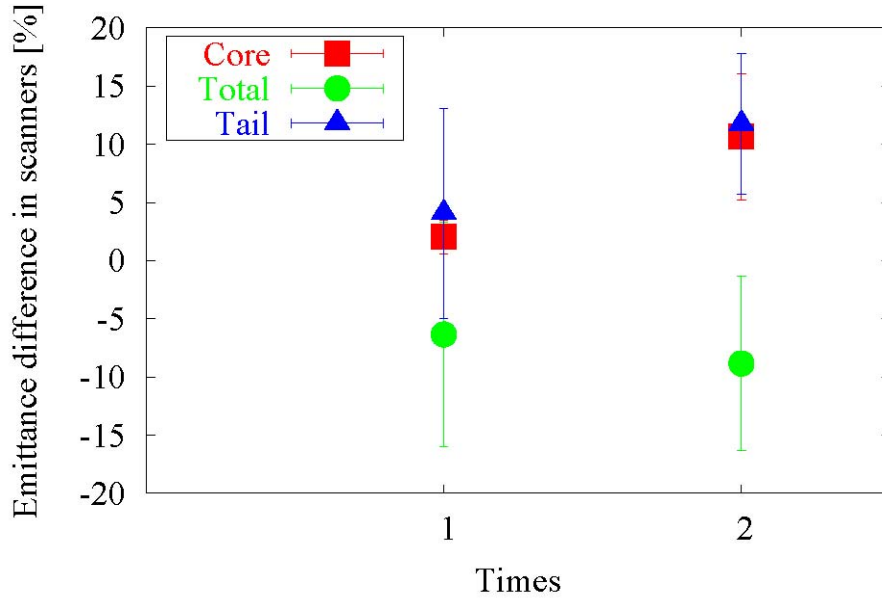
Are these measurements consistent with those?

My preliminary firm conclusion (only 1)

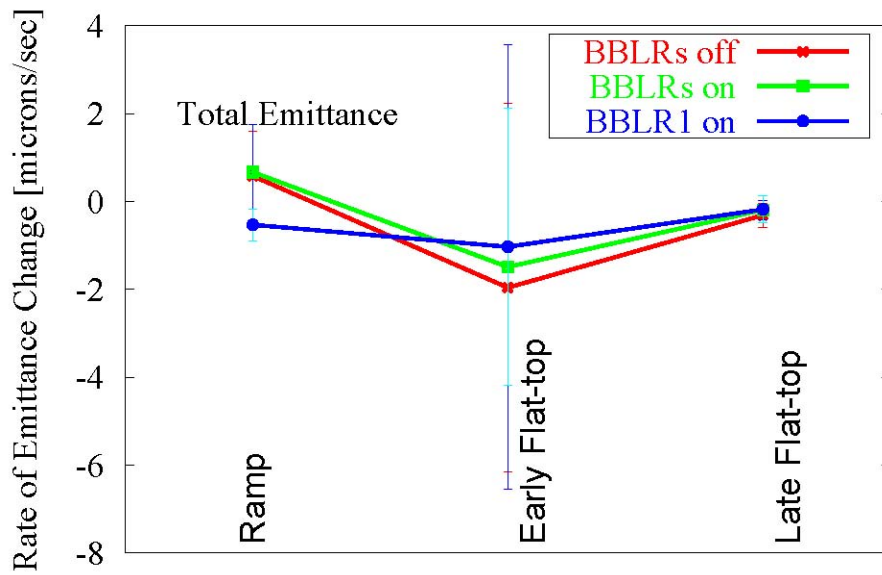
- the core emittance does get shaved with BBLR1. Turning on BBLR2 reduces this shaving.

Tanaji Sen, 13 October 2004

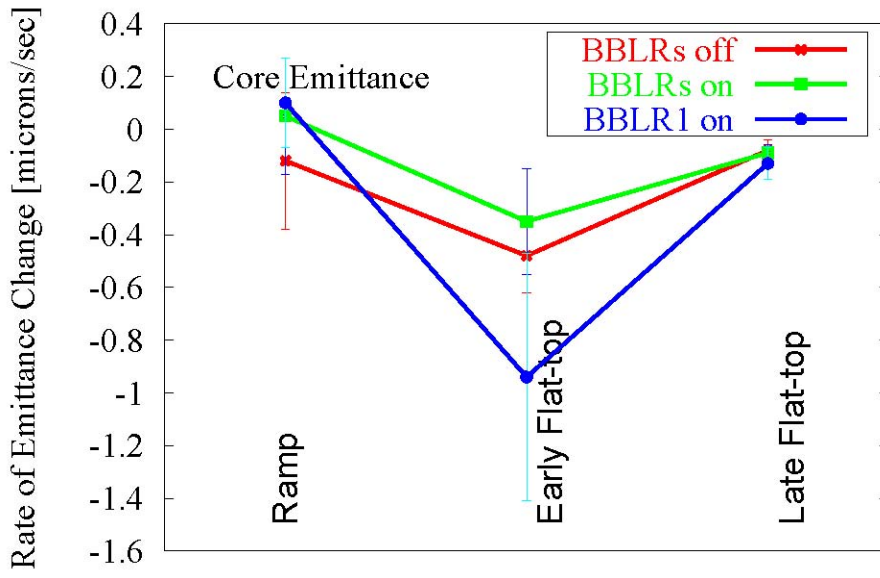
Cross calibration of wire scanners



Rate of Emittance Change during each cycle



Rate of Emittance Change during each cycle



Rate of Emittance Change during each cycle

