

Replacement of Test Chambers at 15E/W in CESRTA

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Cornell Laboratory for Accelerator-based Sciences and Education (CLASSE)

Test Chambers at 15E/W

Two bunch measurements using shielded pickups (SPU) have provided values of quantum efficiency and elastic yield with beam conditioning of test chambers. Measurements with amorphous carbon were made with a synchrotron radiation doses ranging from 0.02 to 200 Amp-hours. These measurements show a change in quantum efficiency for amorphous carbon but not in secondary yield, neither true secondary yield nor elastic yield.



Conditioning effect for a previously unprocessed a-C coating affects the quantum efficiency, not the SEY. The elastic yield value does not affect the 14-ns bunch signal. The elastic yield value *does* influence the signal from the witness bunch delayed by 84 ns. An unprocessed elastic yield as high as 20% can be excluded.

We would like to acquire data for bare aluminum and TiN coated chambers that has a similarly wide range in conditioning dose, because such chambers are expected to show significant true secondary yield conditioning. Also, aluminum has been shown to have high elastic yield, and there exists little information on elastic yield conditioning effects.

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CesrTA Collaboration Meeting - Crittenden, Sikora, Lee



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TE Wave measurements at 15E have been made, but the analysis is complicated by the presence of both bare aluminum and coated chambers. The TE Wave measurement At 15E gives an average EC density over a region that includes both types.

Installing a bare aluminum chamber at 15E would simplify this analysis since bare aluminum would span the whole region. This would provide an independent absolute EC density measurement that can be compared with SPU and RFA measurements.





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Test Chambers at 15E/W

There is also an interest in installing a diamond-like carbon (dl-carbon) chamber at 15W. This would complete the set of RFA measurements of coated surfaces in the same radiation environment.

During the CESR shutdown in the summer of 2012 it is proposed that:

- A TiN coated chamber be installed at 15W (replacing a-carbon).
- A bare aluminum chamber be installed at 15E (replacing dl-carbon).

And in January 2013:

• A diamond-like carbon coated chamber be installed at 15W (replacing TiN).

