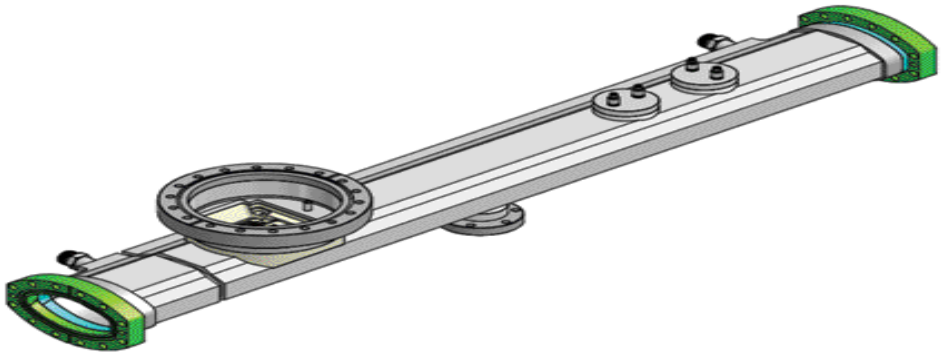
First Results on the Diamond-like Carbon Mitigation Technique From Shielded-Pickup Measurements

– Measurements recorded yesterday evening --



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CesrTA General Meeting
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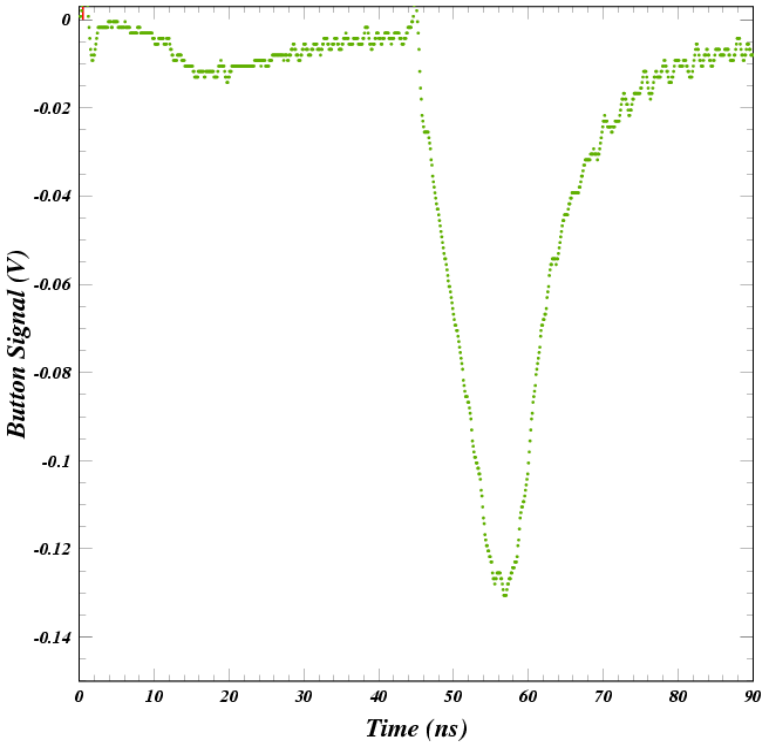
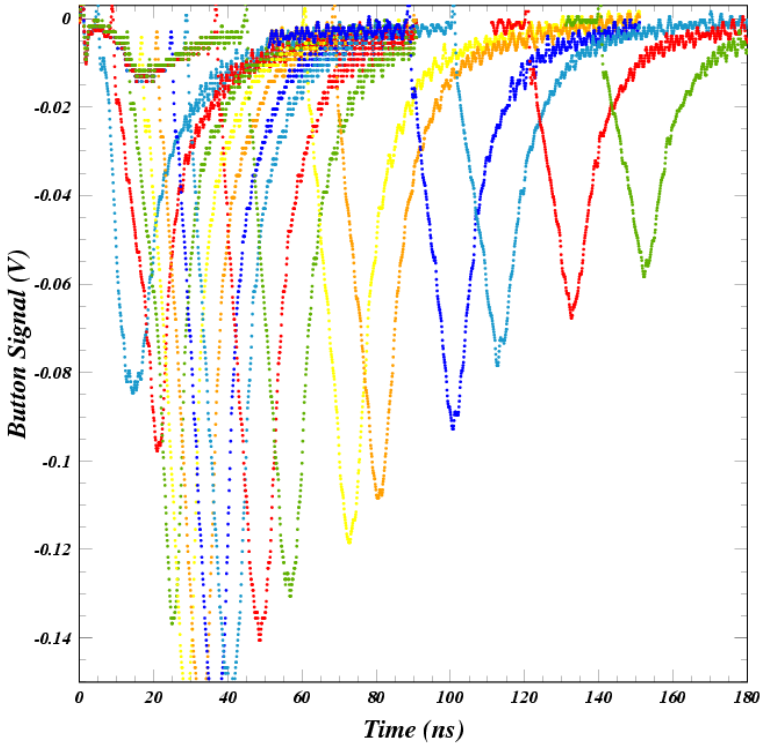
How the Witness-bunch Method Works

Example: 15W, Al v.c., 2.1 GeV, 3 mA/bunch e+ beam, 4-ns spacing

Shielded pickup scope trace for two bunches 44 ns apart



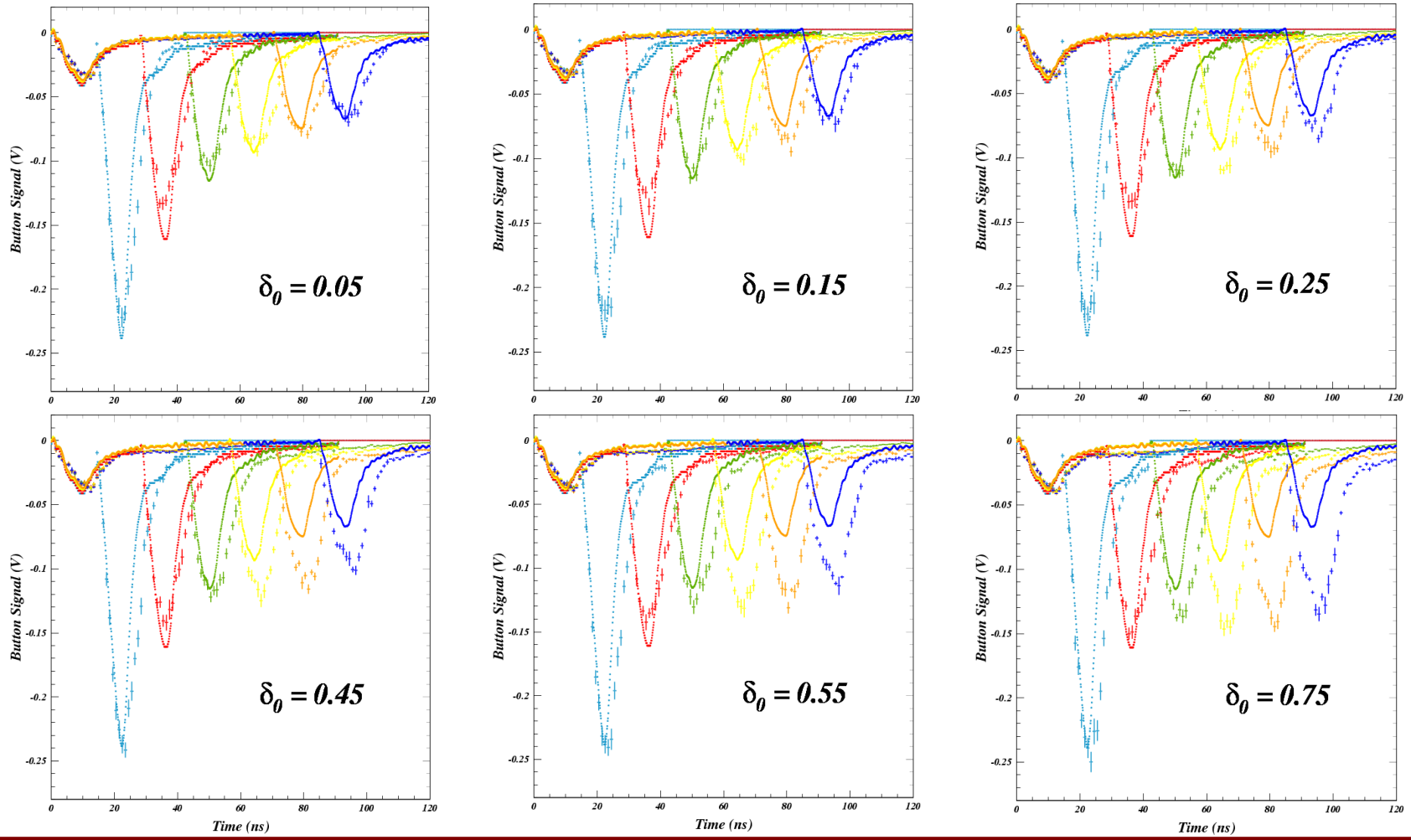
Superposition of 15 such traces illustrating the sensitivity to cloud lifetime



The witness bunch signal includes the single-bunch signal as well as the the signal produced by cloud electrons accelerated into the shielded pickup by the kick from the witness bunch.

Model Sensitivity to Secondary Electron Yield Parameters

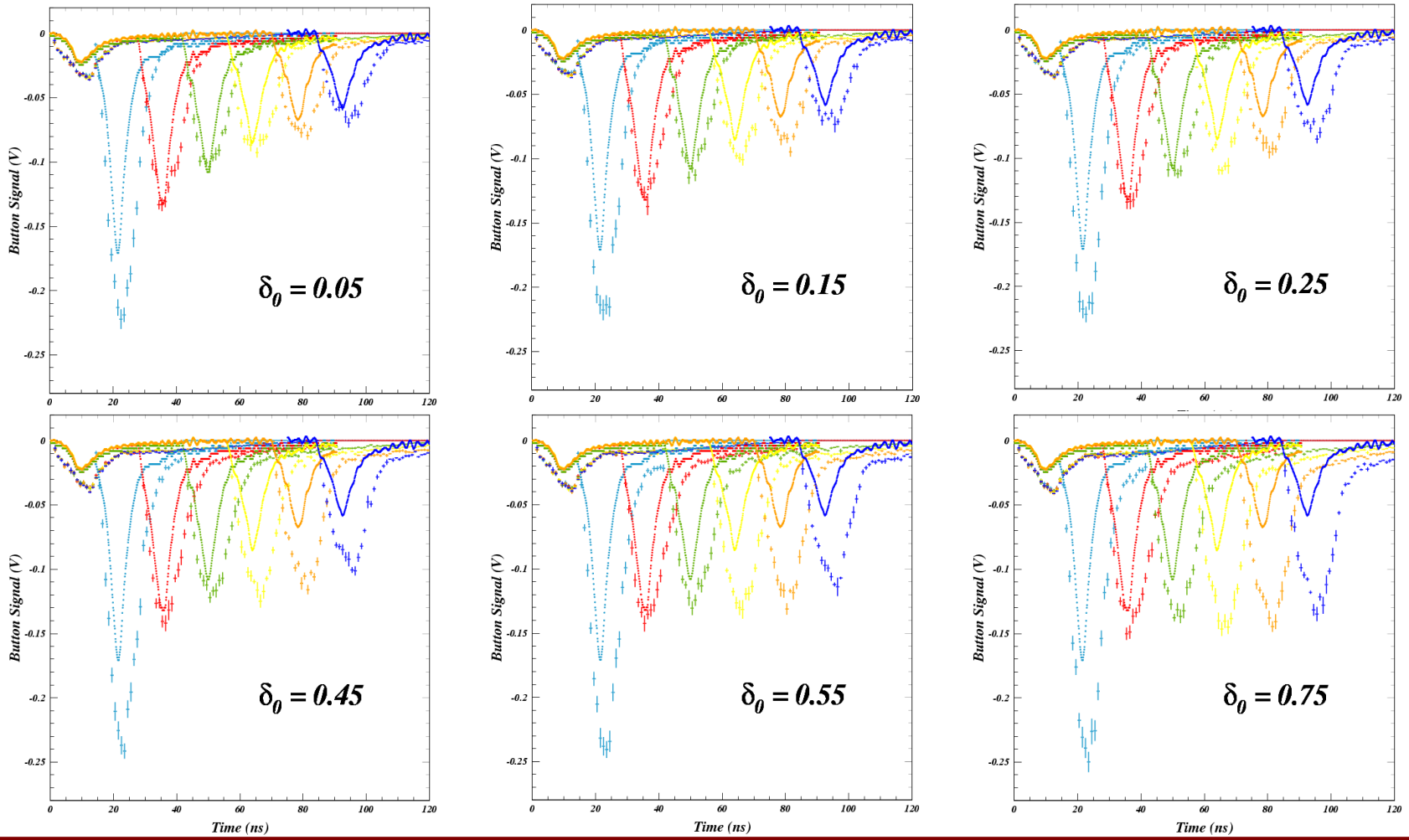
3/27/10: 15E, TiN, 5.3 GeV, 5 mA/bunch e+ beam, 14-ns spacing



This example of ECLOUD simulations shows a preferred value for the elastic yield in a TiN-coated v.c. of δ_0=0.05. A similar value was found for amorphous carbon coating (two different custom v.c.), while the value for bare Al was 0.75.

First Results for Diamond-like Carbon Coating

4/7/11: 15E, DLC, 5.3 GeV, 5 mA/bunch e+ beam, 14-ns spacing



The diamond-like carbon coating exhibits significantly lower values for the quantum efficiency for producing photoelectrons as well as lower secondary yield, both for the true secondary process and the elastic process.