Developing X-Band Capabilities

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About RadiaBeam

• RadiaBeam Technologies, LLC. is a small business with core expertise in accelerator physics.
• Spin-off from UCLA (2003)
• Extensive R&D Program (DOE, DOD, DHS, NSF)
• Growing products line for research laboratories and industrial customers (magnets, diagnostics, RF structures, complete systems)
Advantages of X-Band RF Technology

- Record high gradients
- Leveraged against significant DOE investments into NLC technology
- Small footprint
- Simplified shielding requirements
- Strong industrial base
MicroLinac

- Tech transfer from SLAC
- Portable, air-cooled, ultra-low cost, 1 MeV industrial accelerator for radiography applications (replacement for radioisotope sources)
MicroLinac

• Table-top prototype is under development
• Industrial system to be offered in 2011-2012
• Higher energy version for self contained irradiators under development
X-Band Deflecting Cavity

- compact footprint
- longitudinal resolution at 100 MeV better than 10 fs

<table>
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<th>(\sqrt{Z} E_0 / P_0^{1/2}) [kV/mW(^{1/2})]</th>
<th>(\alpha) [1/m]</th>
<th>(v_g / c)</th>
<th>(E_{\text{max}} / P_0^{1/2}) [kV/mW(^{1/2})]</th>
<th>(L_{\text{TOT}}) [m]</th>
<th>(E_{\text{max}}) [MV/m]</th>
<th>(\tau_F) [ns]</th>
<th>(N_c)</th>
<th>(P_{\text{out}} / P_{\text{in}})</th>
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X-Band Deflecting Cavity

• Present Status: in fabrication

• Adapted cleaning and handling procedures from SLAC (developed for high gradient structures)
X-Band Deflecting Cavity

- 8 cell prototype was assembled and tested
- Commissioning plans at BNL – Summer 2010

(bead pull measurements at SLAC)
Conclusions

• RadiaBeam Technologies is actively developing X-band accelerating systems for commercial applications

• First high gradient structure will be commissioned this year