Comparison of Beam Dynamics for $a/\lambda = 0.17$ and $a/\lambda = 0.18$

G. Stupakov

K. Bane, Y. Nosochkov, T. Raubenheimer
SLAC

ISG Meeting, Tsukuba, July, 1998
Using computer simulation code LIAR, we calculated and compared the emittance growth of the beam due to short-range wakefield in the NLC lattice.

- Sensitivity to quad misalignment for different BNS configurations.
- BNS energy overhead.
- Emittance growth in ATL-like misalignment.
Parameters:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$E_0$</td>
<td>10</td>
<td>[GeV]</td>
</tr>
<tr>
<td>$E_f$</td>
<td>500</td>
<td>[GeV]</td>
</tr>
<tr>
<td>$N$</td>
<td>$1.1 \cdot 10^{10}$</td>
<td></td>
</tr>
<tr>
<td>$\gamma \varepsilon_y$</td>
<td>$4 \cdot 10^{-8}$</td>
<td>[m rad]</td>
</tr>
<tr>
<td>$\gamma \varepsilon_x$</td>
<td>$3.6 \cdot 10^{-6}$</td>
<td>[m rad]</td>
</tr>
<tr>
<td>$\sigma_z$</td>
<td>$150 \cdot 10^{-6}$</td>
<td>[m]</td>
</tr>
</tbody>
</table>
Comparison of wakes for $a/\lambda=0.17$ and 0.18
Comparison of wakes for $a/\lambda=0.17$ and 0.18
NLC linac 100 deg lattice: 3-RF per girder.
BNS profile in the NLC main linac
BNS profiles for RDSS1 wake, $\delta E/E_0$ vs $s (m)$
BNS overhead for different profiles, $\alpha/\lambda = 0.171$
BNS overhead for different profiles $\lambda/\sigma = 0.18$
Transverse emittance growth, $\%$

Vert. emit. growth due to 1 $\mu$ quad offset, $\alpha/\lambda = 0.171$
Vert. emit. growth due to 1 μ quad offset, $\lambda/\lambda_0=0.18$
ATL misalignment, $t=30$ min, $A=5 \times 10^{-7} \mu m^2/m/s$, $\alpha/\lambda=0.171$

(20 seeds)
ATL misalignment, t=30 min, $A=5 \times 10^{-7} \mu m^2/m/s$, $\phi/\lambda=0.18$

(20 seeds)