Fast Damping Ring Kickers for the International Linear Collider

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The problem:

2820 bunches, 337 ns separation.
Total bunch train length: 285 km

An entire bunch train must be stored in the damping ring before injection into the main linac.

Bunch spacing in the damping rings must be much less than 337 ns.

17 km “dogbone” damping ring: ~20 ns bunch spacing
6 km “small” damping ring: ~6 ns bunch spacing

Kicker speed determines minimum damping ring circumference.