

What is possible to achieve with the present technology? What are the present limitations for decreasing the pulse length of the kicker

- What has been achieved
 - 40 ns half sine
 - 1kV
 - 1.5MHz
- Should be possible to optimize for further reduction.
 - Tradeoffs
 - R&D may be necessary
 - Different technological solutions

How are users affected by a kick in the vertical plane?
Are there possible solutions for this that can be done at the beamlines?

- Experience at the ALS (1 year @ 4 kHz and 1 year and 1 week @ 1.5 MHz) without any issues.
- This does not rule out any issues
- Good to try to simulate the impact for different beamlines for a given facility

Do users prefer excitation in the vertical or horizontal plane?

- There potential advantages and disadvantages
- Potential advantages of horizontal
 - Would work for beamlines which do not have an intermediate focus at a non dispersion plane like the PGM
 - For the same number of sigma one would have a larger separation which helps with mirror scattering
 - Larger spacing would help at lower photon energy where there is diffraction limitations
- Potential disadvantages of horizontal
 - Striplines are further apart
 - Larger beam size may require larger kick (depends on the beta functions – need to look at the specific case)

What would be required to implement a PSB solution at MAX IV rings? Is one ring clearly more suitable than the other for this solution? If so, is this motivated by the science case or technical issue on the machine side.

- It not clear of the advantages of one ring over the other from a technological point of view. Many considerations
 - Beam energy
 - Aperture
 - Coupling
 - Real estate (i.e. 3 GeV has short straights with high vertical beta that look appealing however might not be so easy with continuous vacuum chamber)
 - Photon energy (diffraction limit considerations)

Would one gain considerably in flexibility/versatility by using two (or more) PSB kickers together or does the added complexity and synchronization effort outweigh any potential gain.

- Yes there could be advantages
- Might allow more flexibility in the tune choices
- Potential for closed bumps and local control of orbit and repetition rate
- Optimize the displacement at a given user location
- Might be able to increase the rep rate
- Disadvantages
- Take up more real estate. The pulsers have to be well matched. More cost. More diagnostics.