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Quadrupolar multibunch detuning in the ALBA storage ring

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Vacuum chambers of flat aspect ratio are source of a quadrupolar component of long-range resistive wall wake fields whose amplitude only depends on the trailing test particle.
In multi-bunch filling this leads to an accumulation of the long-range quadrupolar resistive wall wake field which expresses in multi-bunch tune shifts on both planes. The tune shifts were measured at the ALBA storage ring and the results were compared to the model of Chao, Heifets and Zotter *

and the model of Blednykh et al.**. As ALBA runs with only 8 insertion devices of which 3 are in-vacuum undulators in relatively short sections with low beta-functions, the quadrupolar detuning is
dominated by dipolar vacuum chambers and the standard vacuum chamber around the ring. The effect of the in-vacuum undulators will be also discussed.

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Footnotes

- Phys. Rev. ST-AB 5, 111001 (2002)

** Phys. Rev. AB 19, 104401 (2016)

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