# *Dynamic intensity dependence reduction with FONT FB*

Intensity dependence for 2nd bunch.

Beam orbit was corrected to be same or FB ON/OFF by monitoring 2 bunch BPMs.
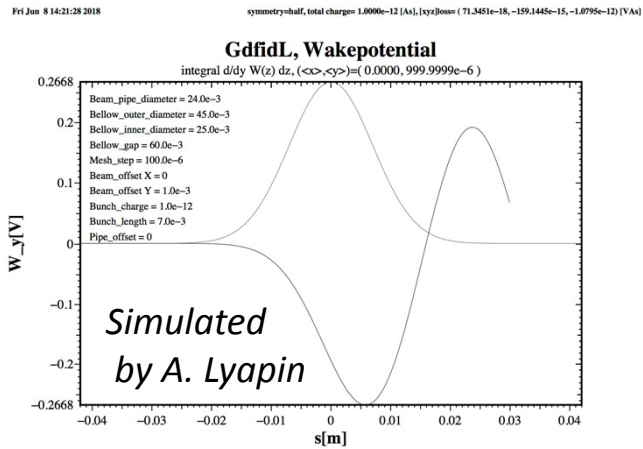
Summary of IP angular jitter

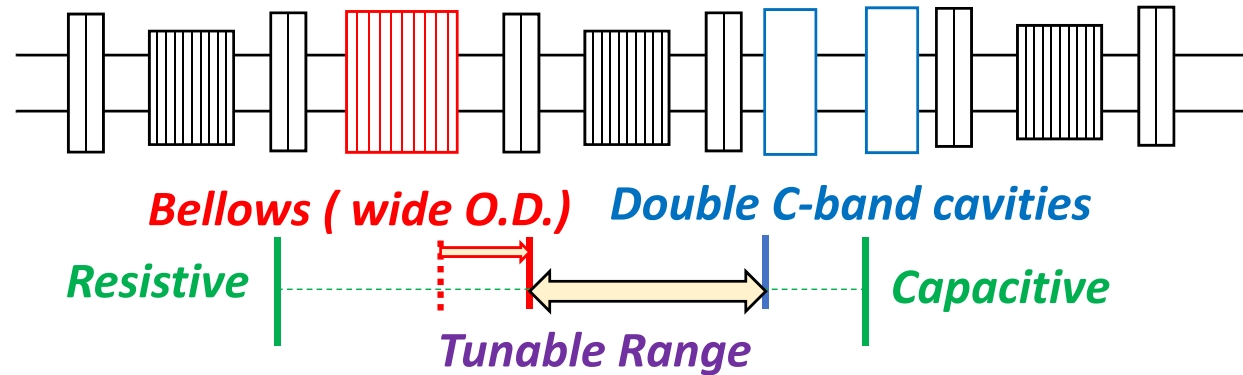|	FONT FB OFF		FONT FB ON	
	1st bunch	2nd bunch	1st bunch	2nd bunch
N=2e9	267 urad	**230 urad**	213 urad	**60 urad**
N=4e9	219 urad	**224 urad**	189 urad	**48 urad**
N=6e9	198 urad	**192 urad**	188 urad	**44 urad**
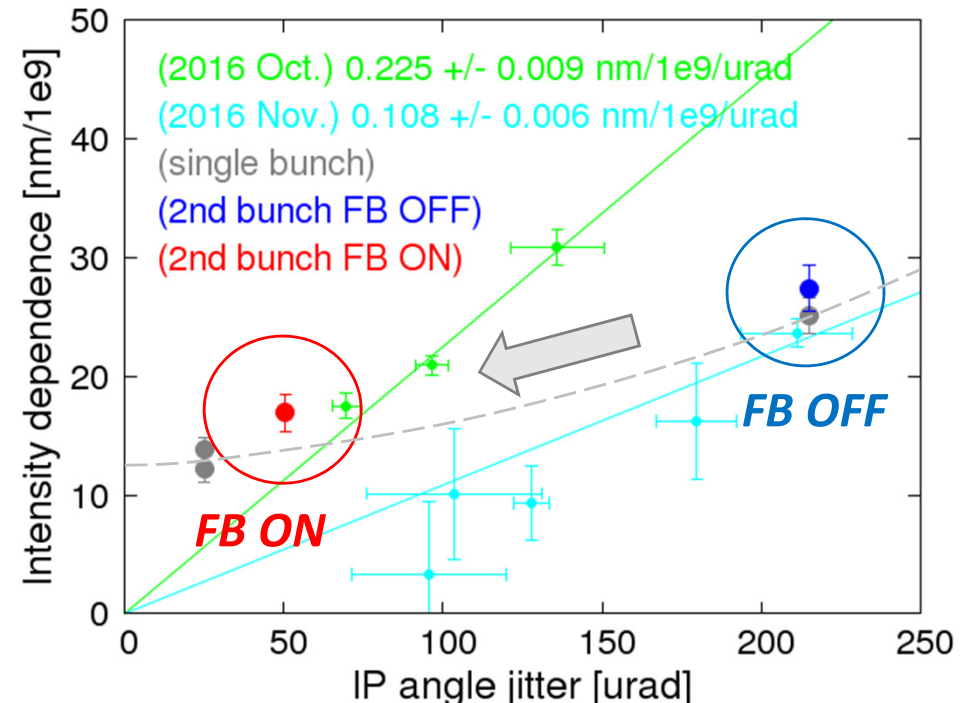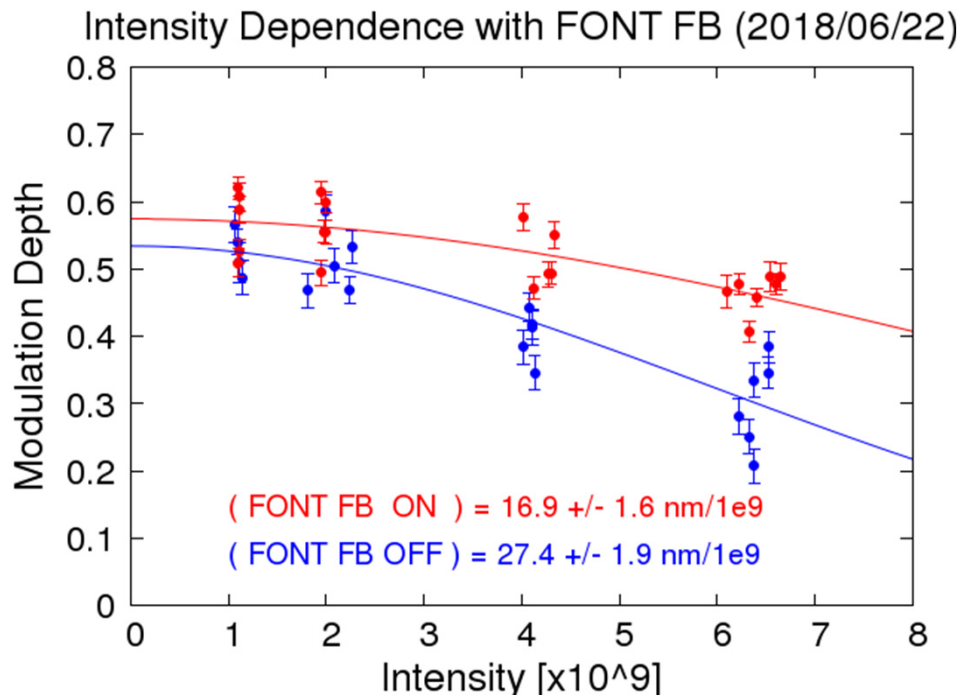
Minimum intensity dependence (static) in June 2018 was 13 nm/1e9.

The intensity dependence was reduced to be 17 nm/1e9 by FONT upstream FB.
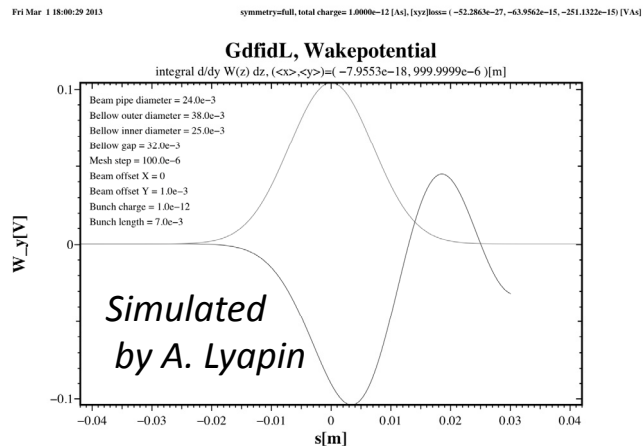*(The static intensity dependence was dominant for the data of FB ON.)*
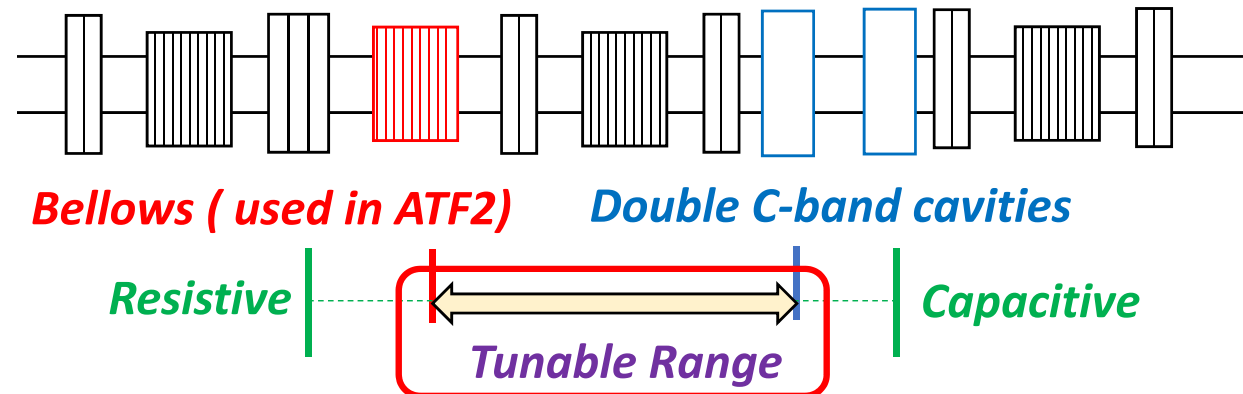
2018 June : (static) = 13 nm/1e9

Fri Jun 8 14:21:28 2018   symmetry=half, total charge= 1.0000e−12 [As], [xyz]loss= (71.3451e−18, −159.1445e−15, −1.0795e−12) [VAs]

GdfidL, Wakepotential
integral d/dy W(z) dz, (<x>,<y>)=(0.0000, 999.9999e−6)

Beam_pipe_diameter = 24.0e−3
Bellow_outer_diameter = 45.0e−3
Bellow_inner_diameter = 25.0e−3
Bellow_gap = 60.0e−3
Mesh_step = 100.0e−6
Beam_offset X = 0
Beam_offset Y = 1.0e−3
Bunch_charge = 1.0e−12
Bunch_length = 7.0e−3
Pipe_offset = 0

Simulated by A. Lyapin

Present setup (same to 2018 June)

Bellows (wide O.D.)   **Double C-band cavities**

Resistive   **Capacitive**

Tunable Range

2018 November : (static) = 5 nm/1e9

Fri Mar 1 18:00:29 2013   symmetry=full, total charge= 1.0000e−12 [As], [xyz]loss= (−52.2863e−27, −63.9562e−15, −251.1322e−15) [VAs]

GdfidL, Wakepotential
integral d/dy W(z) dz, (<x>,<y>)=(−7.9553e−18, 999.9999e−6)[m]

Beam pipe diameter = 24.0e−3
Bellow outer diameter = 38.0e−3
Bellow inner diameter = 25.0e−3
Bellow gap = 32.0e−3
Mesh step = 100.0e−6
Beam offset X = 0
Beam offset Y = 1.0e−3
Bunch charge = 1.0e−12
Bunch length = 7.0e−3

Simulated by A. Lyapin

Proposed setup

Bellows (used in ATF2)   **Double C-band cavities**

Resistive   **Capacitive**

Tunable Range

3

Beam time schedule at last measurement

	MON	TUE	WED	THU	FRI
OWL		2-bunch BPM calibration			• Wakefield optimization • 2-bunch orbit tuning
DAY				• 2-bunch Correlation check • Optics change to low beta	Intensity dependence reduction with FONT FB
SWING				Beam size tuning by single bunch	

The comparable beam time is necessary to perform the dynamic intensity dependence reduction.
 => Can the beam time arrange ?

The 2-bunch BPM calibration is necessary. => Can Alex and/or Alexey help ?

The upstream FONT FB is necessary.   => Can FONT group help ?