First Results of Antisolenoid Simulation

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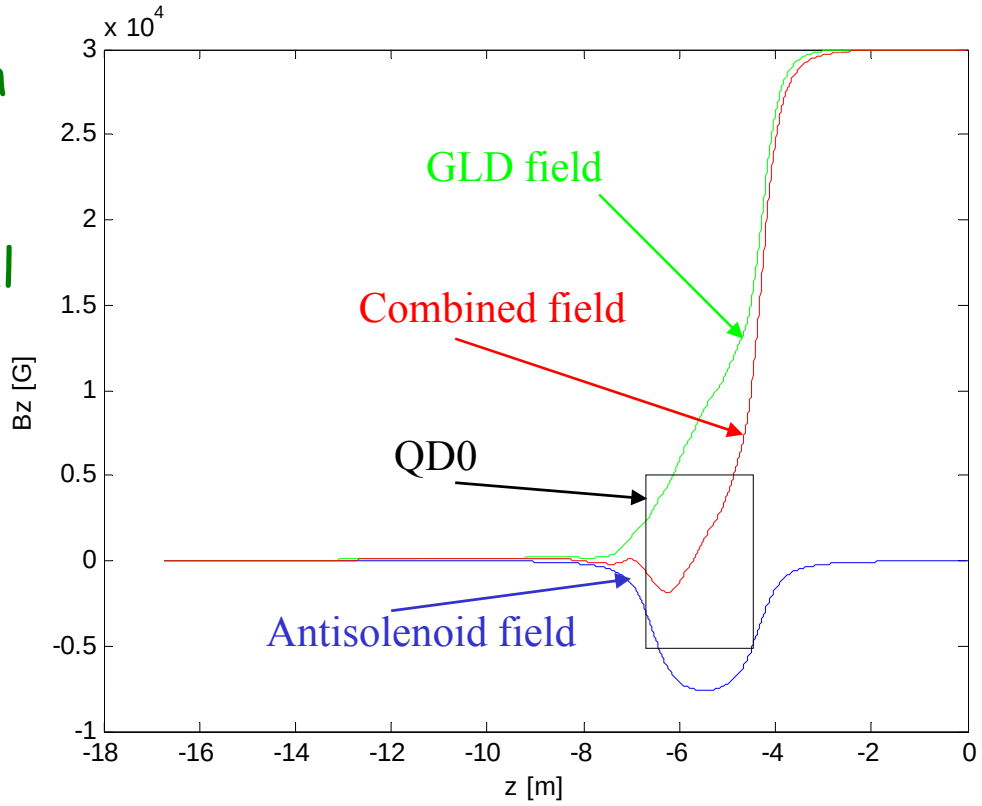
Introduction

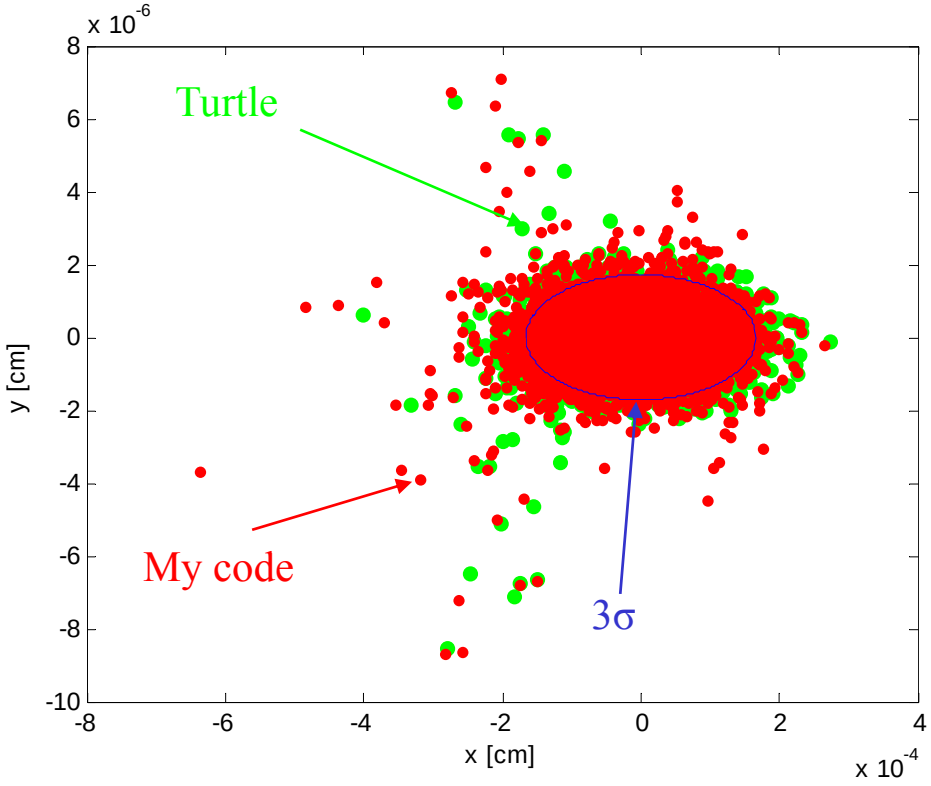
- The overlapping of the detector solenoid field with the final doublet quad results in the growth of beam emittance and vertical displacement of beam's trajectory in the IP.
- Andrei, Yuri and Brett devised and studied the algorithm of local compensation of these disturbances by short antisolenoid.



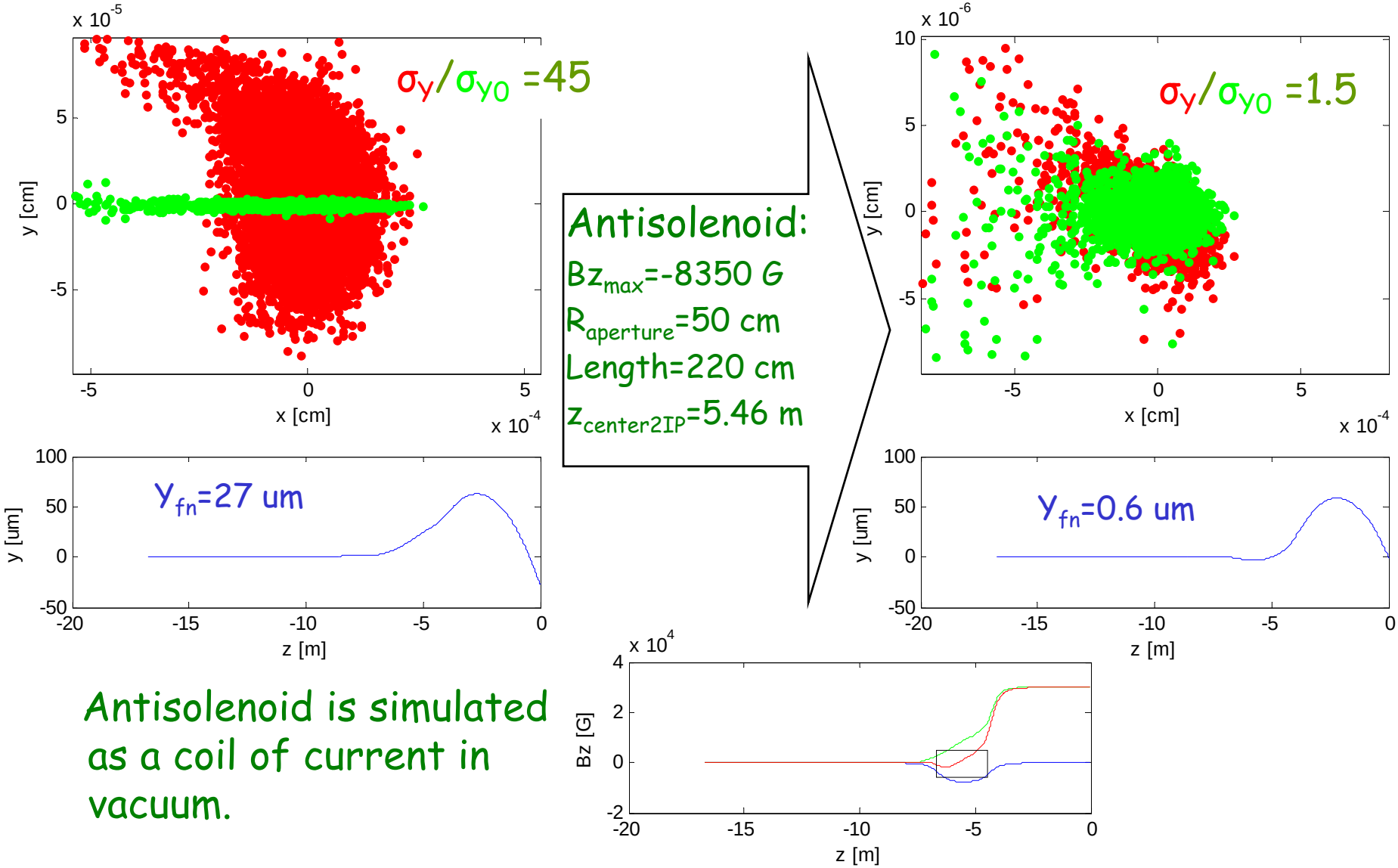
- This algorithm was proved to be successful for NLC beam in case of L*=3.5 m.

The code

- To study a possibility of antisolenoid compensation for different L* a new code has being developed.
- It allows beam tracking for the optical elements immersed in external magnetic field. It also allows to combine different elements with each other and, generally speaking, to perform tracking in arbitrary field.
- The code was compared to Turtle for zero DS field.
- Also, some comparison with Andrei, Yuri & Brett results for NLC beam (SiD, 20mrad angle) was done.

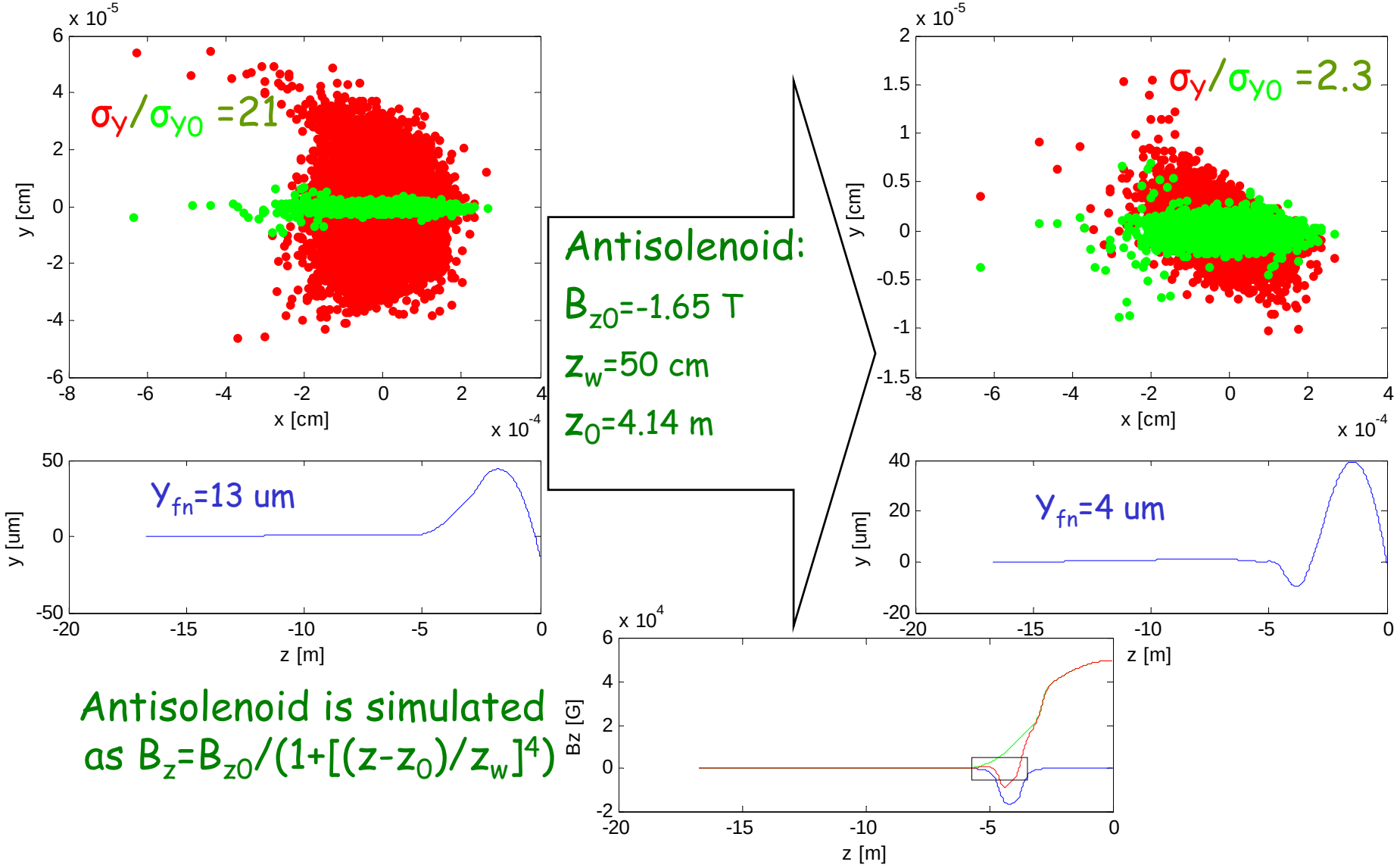


Results: L*=4.5m, GLD



Antisolenoid is simulated as a coil of current in vacuum.

Results: L*=3.5m, SiD



Antisolenoid is simulated as $B_z=B_{z0}/(1+[(z-z_0)/z_w]^4)$

Conclusions

- Antisolenoid compensation works for different L* and detector solenoid fields.
- The code works fine, at least it is suitable for antisolenoid's simulations.