Improving the G4MICE Simulation

Matthew Littlefield

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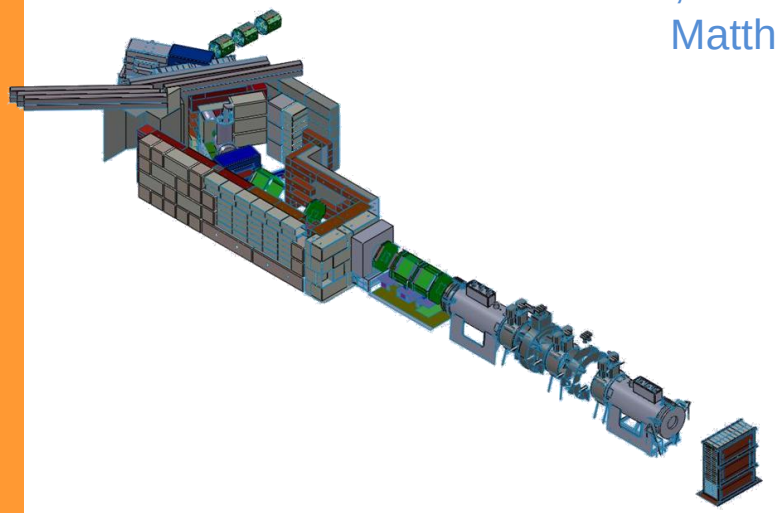

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Why Improve G4MICE?

- The current simulation of Stage 6 is inaccurate
- Does not agree with other results
- Can be a useful analysis tool

Uses after the Improvement?

- The simulation will produce data which can be compared with MC and real data
- Can be used as an initial analysis whilst experimenting
- Provides a visualisation of what is happening in the beam line to increase our understanding

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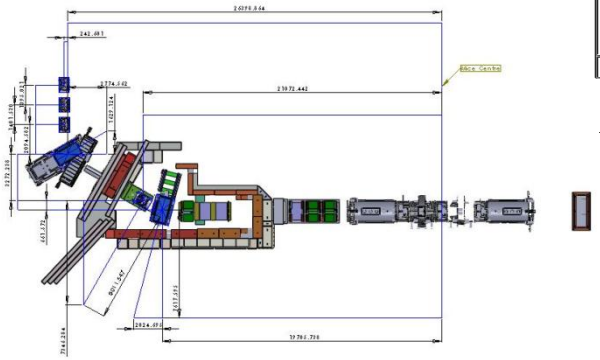
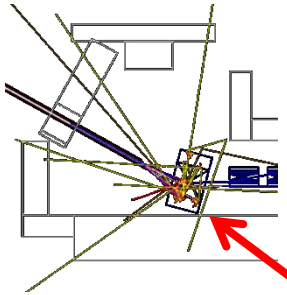
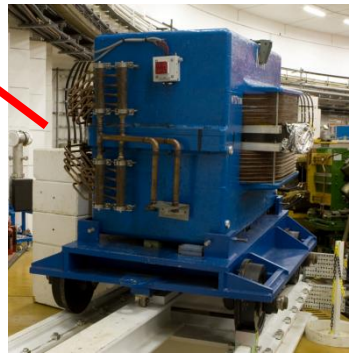
What is being Improved?

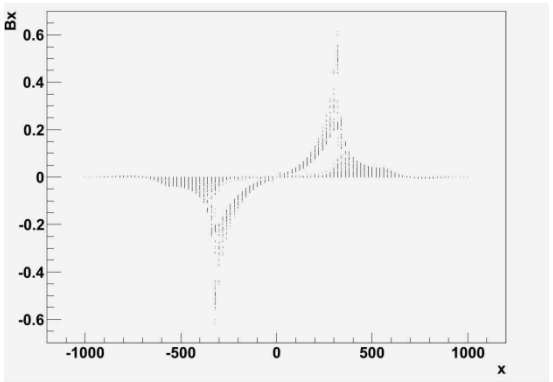
- The Positions of each component
- The Geometries of each component
- The Field Maps of each component







Graph of Dipoles EM Field in the X Direction



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The Simulations Progress

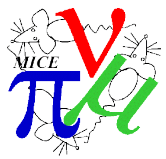
Beamline Component	Status: Position	Status: Geometry	Status: Field Map if necessary
Beam (target)			
Q 1,2,3			
D1			
DS			
DSA (walls)			
D2			
Q 3,4,5			
Ckov			
Tracker 1			
AFC 1			
RFCC 1			
AFC 2			
RFCC 2			
AFC 3			
Tracker 2			
BLM, TOF, GVA ?			

NB: Beam properties needs to be set to realistic properties

NB: Cuurent model crashes the simulation

Key

Nothing	Needs to be Verified	Ready



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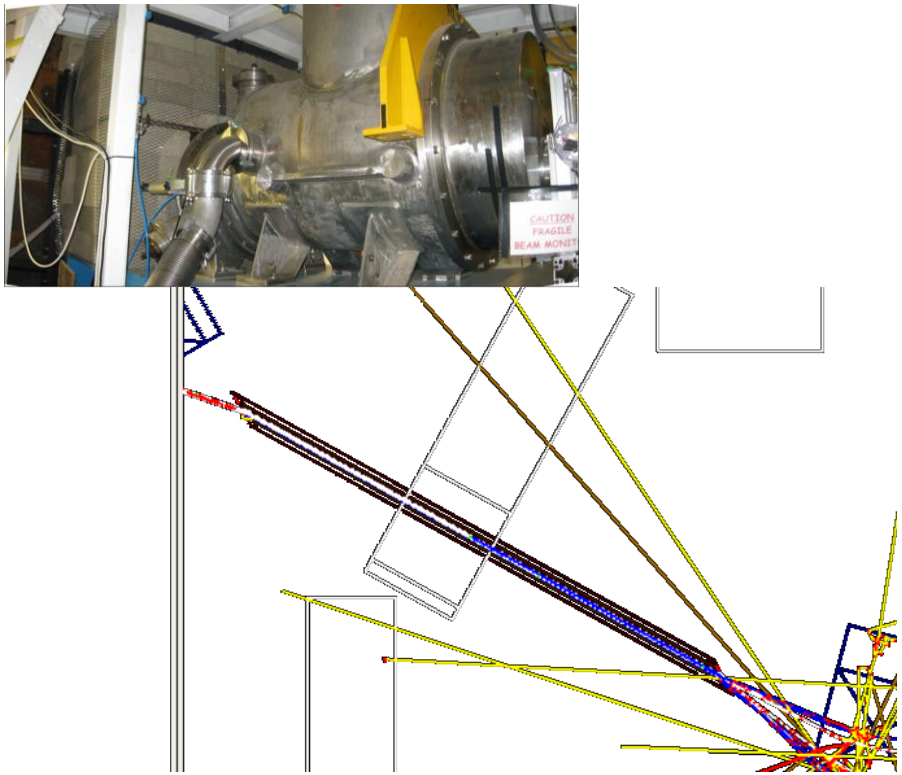
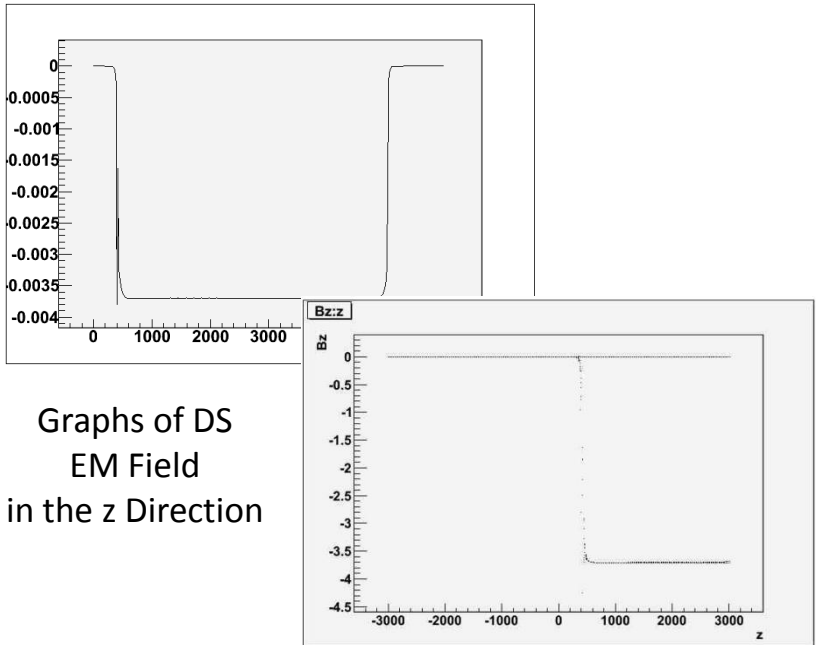
Current Problems

Decay Solenoid

Geometry



Field Map



Graphs of DS
EM Field
in the z Direction

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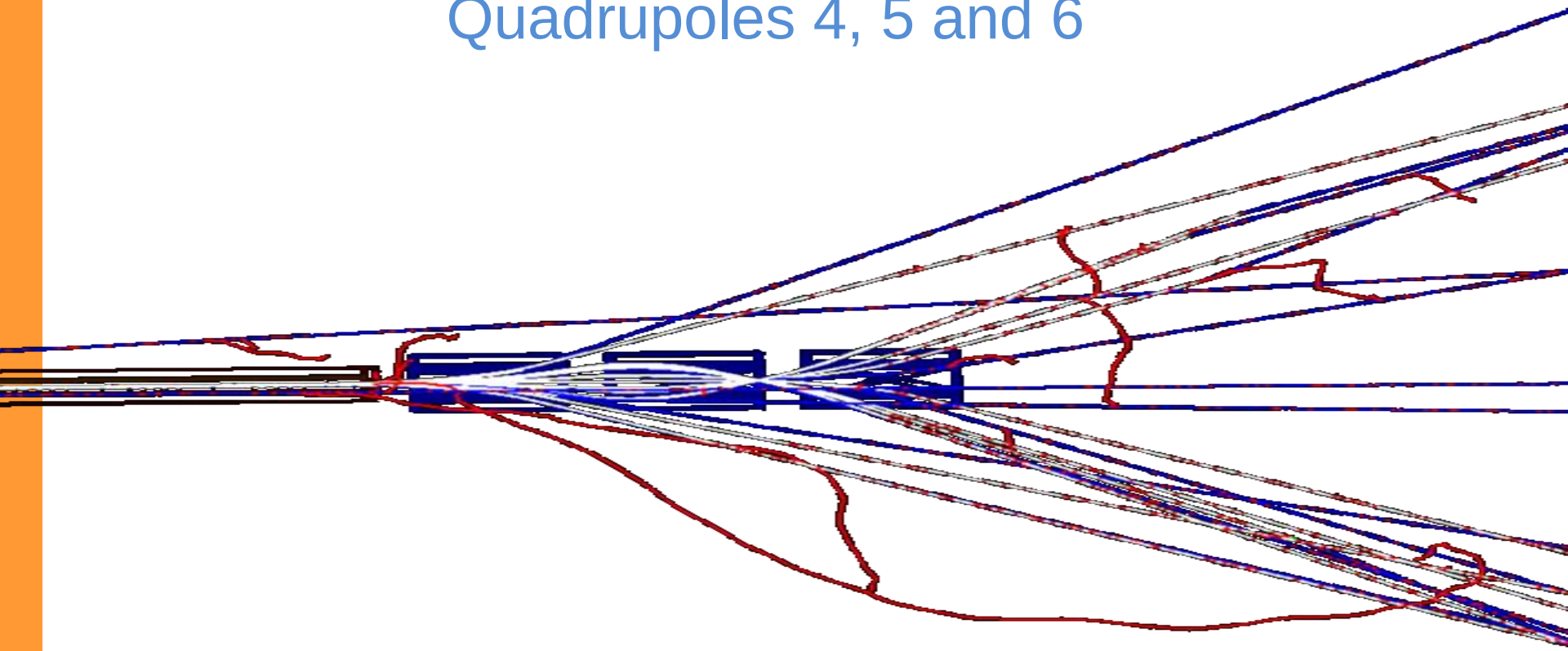
Current Problems

Quadrupoles 4, 5 and 6



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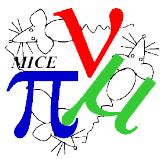
An Additional Improvement

Particle	Colour
Default	Green
Muon+	Blue
Electron	Red
Pion	White
Positron	Purple
Gamma	Yellow
Neutron	Brown
Proton	Pink



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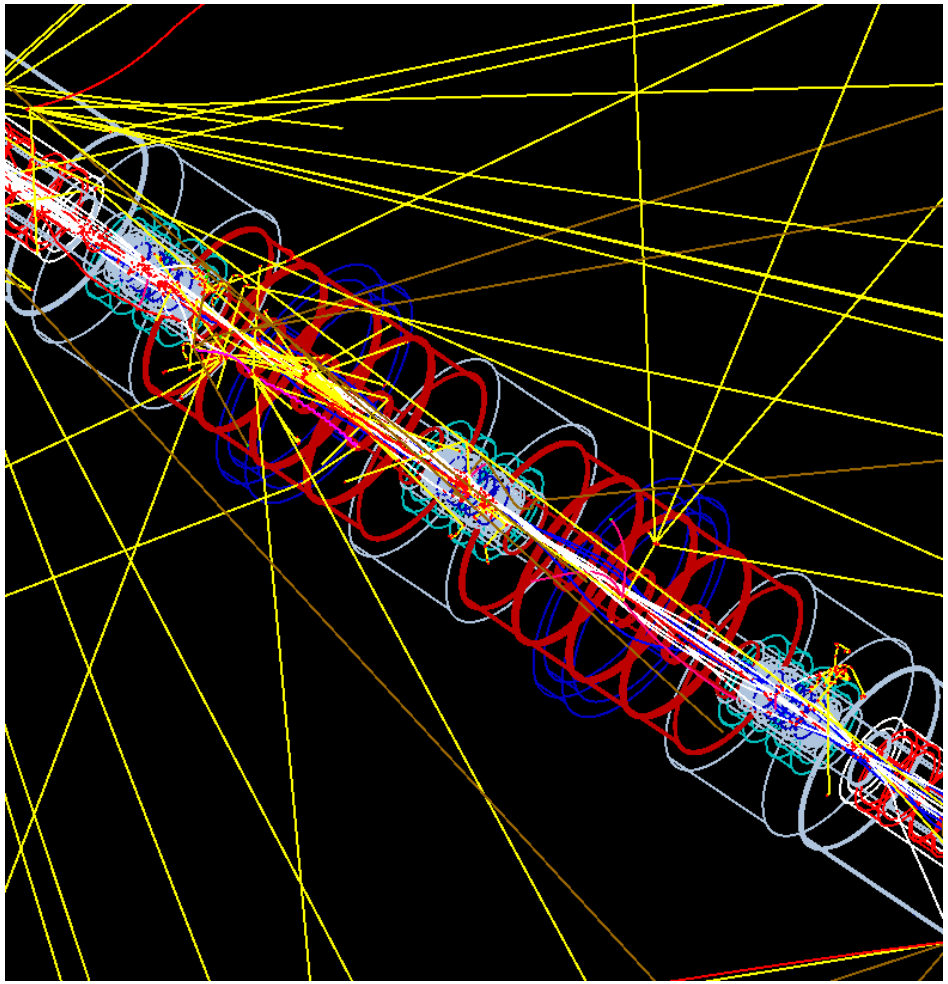
An Additional Improvement



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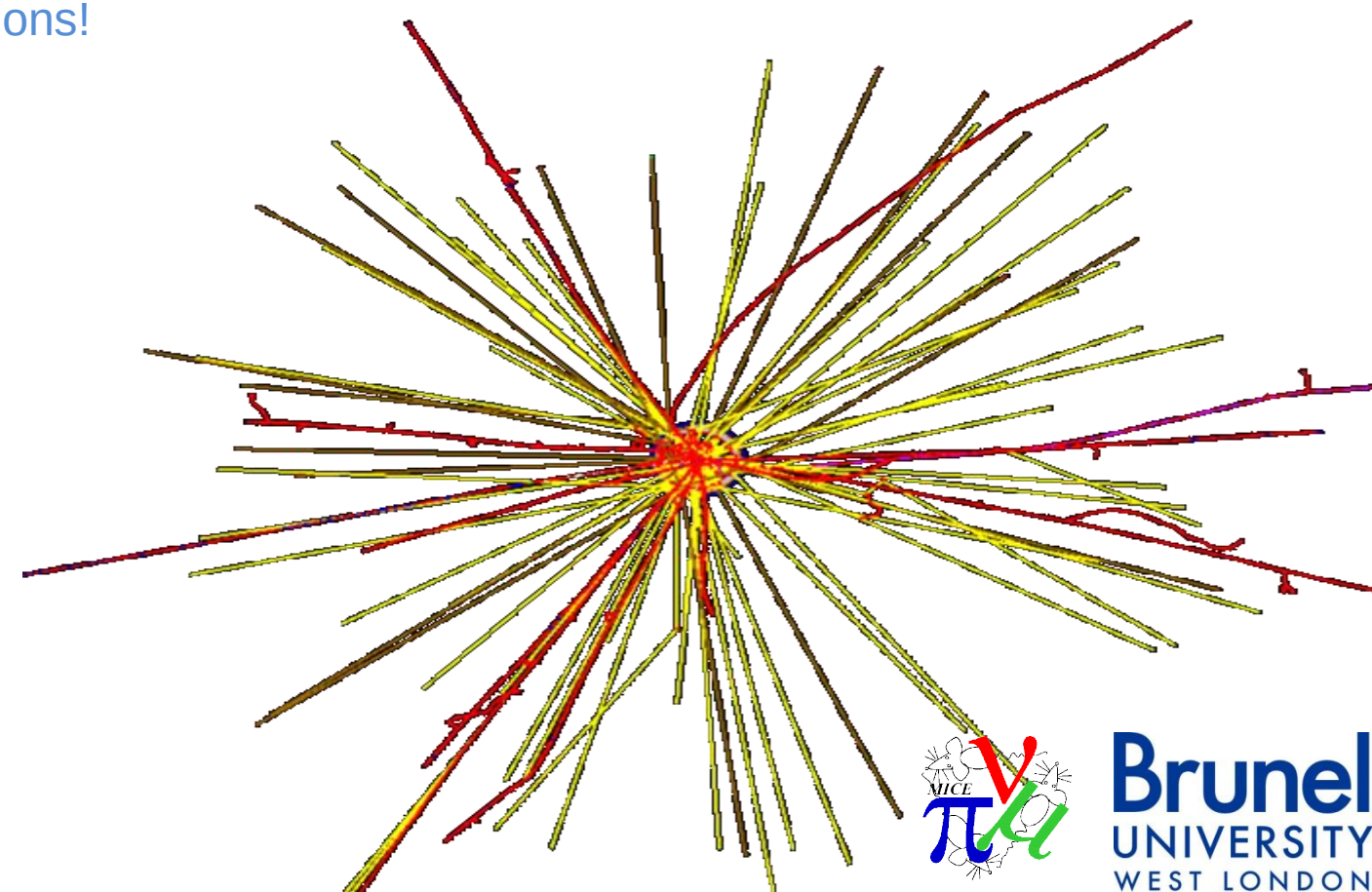
Future Work

- Finish updating the geometries and field maps
- Run large simulations!



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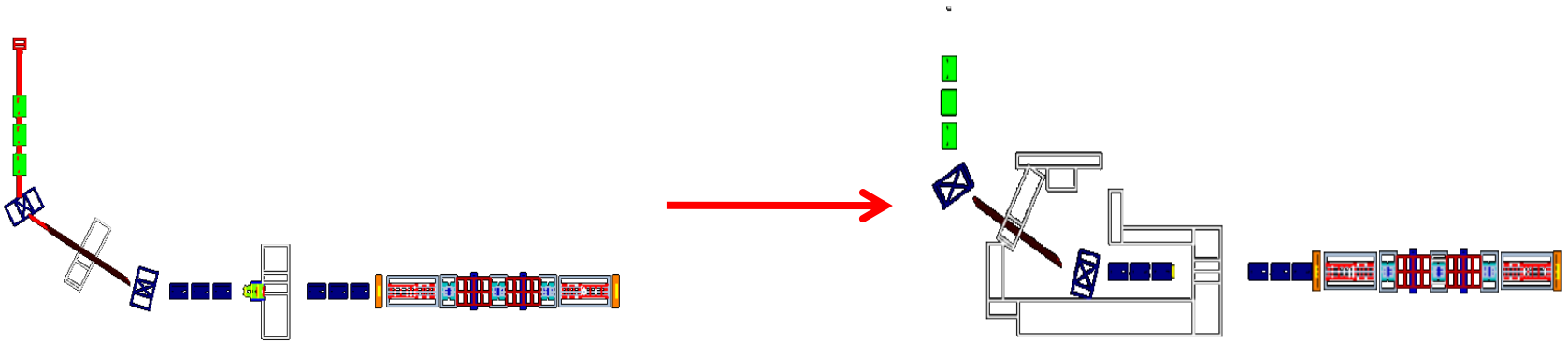
Summary

- Majority of components positions have been set to real positions which have been determined by technical drawings

- Majority of components geometries have been updated

- Field maps of dipoles have been updated



Any Questions?

Thank You for Listening

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