



Merlin status and plans

Roger Barlow

*Rob Appleby, Sandy Donnachie, James Molson,
Haroon Rafique, Maurizio Serluca, Adina
Toader*

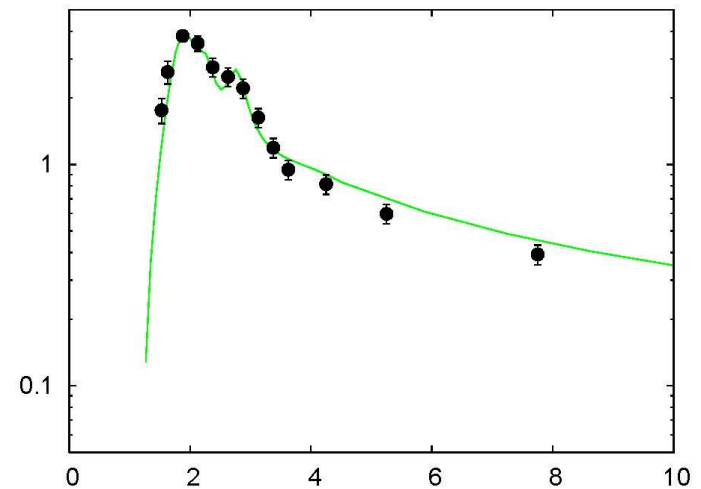


Work in progress: 1

Modelling of diffractive pp scattering through
Regge theory fit to existing experimental data
(from ISR to Tevatron)

gives $\frac{d^2\sigma}{dt dM^2}$ over wide range of t and M

Paper draft in preparation.





Work in progress: 2

“The Practical Pomeron”

- Implementation of diffractive model (from part 1) and of improved Regge fit to elastic scattering (previously published)
- Produces model of soft scattering for use in Merlin - or any other program.
- Benchmarking (using Merlin) against simple sixtrack type $e^{b t}$ model using detailed LHC loss maps (though this is to investigate the models rather than the LHC)

Paper draft in preparation.



Work in progress: 3

Merlin 4.1 release (SourceForge) and user guide

New release will include

- More sophisticated collimation models (parts 1 and 2) – as options.
- Mixtures of materials for new collimator types
- Ability to read LHC MAD .tfs files
- More refined aperture calculations
- Various other nice stuff e.g. dE/dx from Landau distribution

To be part of James Molson's PhD thesis, due January.



Work in progress: 4

LHC studies using Merlin (with new features)

- Existing LHC: Loss maps for B1 and B2
 - thorough checking of machine and optics
 - ideal machine @4TeV: comparisons with 6track and measurements
 - Ideal machine at 7 TeV

Analysing the effects induced by errors.

- magnetic field errors,
- magnetic element alignment,
- collimator alignment,
- collimator deformation

These are in progress and will be reported at Frascati meeting (Maurizio)

- Future LHC: crab cavities, crystal collimation, hollow beam collimation...

If we know the physics, we can put it in Merlin and see the effects.



Discussion...

These are our ideas of what is necessary and useful to do.

We are open to further suggestions from people closer to the machine itself