

Exec Board Meeting

July 30th, 2008

Jaco & Rob

Where are we on this

- Intense activity since first presentations > 3 weeks ago
- Question was if we could converge quickly
- Time to touch base with EB to discuss this

July 9, Open Presentation Meeting

- Spokes' introduction - Jaco: [pdf](#) or [ppt](#)
 - Analysis presentation - Paolo: [pdf](#) or [ppt](#)
 - Godparents' report - Doug: [pdf](#) or [ppt](#)
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July 16, Meeting addressing Questions/Concerns/Clarifications

- Spokes' intro - Jaco/Rob: [pdf](#) or [ppt](#)
 - Luciano: [pdf](#)
 - Pasha: [pdf](#)
 - Godparents' report - Kevin: [pdf](#) or [ppt](#)
 - Clarifications/Extra Studies - Paolo: [pdf](#) or [ppt](#)
 - Matt: [pdf](#) or [ppt](#) (presented on July 17)
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July 30, Meeting

- GP report on the "major questions" on the analysis - Kevin: [pdf](#) or [ppt](#)
 - Some more Q+A by the Authors - Paolo: [pdf](#) or [ppt](#)
 - Study of the Multimuon Sample by the MIT group - Guillermo: [pdf](#)
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Godparents Activities

- [Meeting with Pasha](#) (07/11/08) ([minutes posted on 07/17/08](#))
- [Meeting with Luciano](#) (07/14/08) ([minutes posted on 07/17/08](#))
- [Meeting with Matt](#) (07/15/08) ([minutes posted on 07/21/08](#))
- [Meeting with Aseet](#) (07/18/08) ([minutes posted on 07/22/08](#))
- [Requests to authors and answers received](#) ([posted on 07/24/08](#))

New studies by authors

Useful links referring to frequently asked questions

- [Plots related to the muon properties](#) (updated on 25/7, 18:20CDT)
- [Plots related to the muon quality](#)
- [Plots related to the SVX hit distributions](#)
- [Plots related to the muon multiplicity](#)
- [Plots relevant to muon fake rates](#)
- [Plots related to the impact parameter of muons around \$D^0\$](#)
- [A collection of some EventDisplays](#)
- [Muon multiplicity and impact parameter in QCD events](#) (added on 10/7, 13:40CDT)
- [COT layers vs impact parameter](#) for muons in QCD and Ghost events (added on 10/7, 16:40CDT)
- [Info on the dataset used](#) (updated on 17/7, 12:08CDT)
- [Plots related to \$K_S^0\$](#) (added on 14/7, 13:55CDT)
- [Plots related to \$\Lambda \rightarrow p \pi^-\$](#) (added on 14/7, 16:10CDT)
- [Frequently asked plots](#) on Nvertices, d/σ_d of the muons and $\delta\phi$ (stub-track) (added on 15/7, 17:00CDT)
- [Plots related to muon z-vertex](#) (added on 16/7, 17:30CDT)
- [\$\phi\$ distributions of muons](#) (added on 22/7, 14:20CDT)
- [Muon multiplicity in the cones](#) (updated on 23/7, 14:20CDT)
- [R-z distributions of dimuon vertices](#) (updated on 25/7, 18:10CDT)
- [A muon is a muon: \$\delta\phi\$ track-stub plot of muons in J/psi events](#) (updated on 25/7, 17:00CDT)
- [Muon multiplicity in a cone: The decade plot in numbers](#) (added on 24/7, 17:45CDT)

Questions & Answers

- Questions/Comments from [A. Bodek and Responses](#)
 - Questions/Comments from [D. Stuart and Responses](#)
 - Questions/Comments from [P. Bussey and Responses](#)
 - Questions/Comments from the [Rome group and Responses](#)
 - Questions/Comments from the [Athens group and Responses](#)
 - Questions/Comments from the [Karlsruhe group and Responses](#)
 - Questions/Comments from the [CIEMAT group and Responses](#)
 - Questions/Comments from the [Santander group and Responses](#)
 - Questions/Comments from the [Oxford group \(A\) and Responses](#)
 - Questions/Comments from the [Oxford group \(B\)](#)
 - Questions/Comments from the [Glasgow group \(general comments\)](#)
 - Questions/Comments from the [Glasgow group \(detailed questions\)](#) and our [answers](#)
 - Questions/Comments from the [New Mexico group and Responses](#)
 - Questions/Comments from the [Purdue group and Responses](#)
 - Questions/Comments from the [MIT group and Responses](#)
 - Questions/Comments from the [Fermilab group and Responses](#)
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- And more by e-mail, visits to authors, etc.
 - Authors and GP's working 110% on this
 - The last few weeks have energized the collaboration
 - People re-engaging in the experiment and curious
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- Thanks for your participation and
 - Thanks to the authors for the interesting work presented

From the Godparents [recap]

- Ghost sample has interesting properties [and correlations]
 - Large yield, long impact parameter tails, rate of additional muons, SS/OS in trigger muons, track multiplicity in cones, correlation of # of muons in cones
- Questions and studies regarding the analysis focus on the source/cause of the Ghost sample.
 - Its existence seems well-established in this analysis.
- This is an important point. Regardless of the source of the Ghost sample, it very likely explains several of the effects the authors listed:
 - Discrepancies in
 - the b cross-section
 - χ -bar
 - Low mass dileptons
- This analysis is interesting/important independent of the source of the Ghost sample

Explored possible sources for the excess & properties

- Summarized in GP's talk yesterday:
 - Tracking failures
 - Rate vs time/luminosity
 - Trigger bias
 - Geometry & material interactions
 - Heavy-flavor
 - Decay-in-flight
 - Punch-through
- Many checks/studies - perhaps not properly represented in paper
 - Control samples show good understanding of these effects
- But there are several caveats - also perhaps not represented properly in paper, ex:
 - Discussion on muon purity
 - Limitations of fake rate matrix
 - Jets show tails and multi-muons
 - Expected to see this - question is at what level
 - Difficult to answer this
- So far, no mechanism found that clearly and quantitatively explains the level of the effect and the correlations seen

How to proceed?

- We have not fully ruled out detector effects & known physics
- We have not fully ruled out the possibility of something interesting going on in these events
- Unlikely we will converge completely on a short [few weeks] timescale
- We cannot keep this intensity for a longer timescale
 - Many other things on the collaboration's plate
 - Spokes and GP's have been spending large fraction of their time here
 - The next timescale then becomes many months
- Q: should we attempt to publish quickly what we have so far?
 - This sentiment was expressed by a number of institutions/people
 - Before and also after the presentations
 - Establish primacy on the effects observed
 - Allow for further studies at a more natural pace
 - Authors and other collaborators are interested
 - Pragmatic for many reasons
 - We would like to hear from everyone
- We want to discuss next a possible format for such publication and then to see if people are comfortable with such path
 - Some suggestions taken from peoples communications with us

The Outline

- 1) Ghost events presented as a possible explanation of the discrepancies in b - \bar{b} cross section, χ -bar and low mass dileptons
- 2) Discussion of the properties of these ghost events in contrast to the QCD control sample
 - Discussion of all the possible sources of these events - detector effects and known physics.
 - What is known well
 - What are the limitations in our understanding
 - Discussion of other samples that show some of these properties
- 3) Very modest & minimal hook on possible new physics sources for this
 - Point out multi-muon models in the literature
 - Perhaps a couple of studies on the 8-tau conjecture
 - More studies could go in a separate “MC studies” paper
- 4) Conclusions
 - So far could not entirely rule out detector effects or known sources
 - Studies continue on possible origins of the effect
 - Possibly solves the puzzle for discrepant measurements

Discussion

- We would like to hear peoples' thoughts on how you would like us to proceed
- Please email us your suggestions and comments over the next few days so we have a complete picture
- The floor is open for discussion