

Run-10 Medium-Energy Running

Stefan Bathe for PHENIX

RHIC Machine-Experiment Meeting

3/16/2010

Run-10 Calendar

January

Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

February

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

March

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

April

Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

May

Su	Mo	Tu	We	Th	Fr	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

June

Su	Mo	Tu	We	Th	Fr	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

10 weeks @ 200 GeV

4 weeks @ 62 GeV

1.5 weeks @ 39 GeV

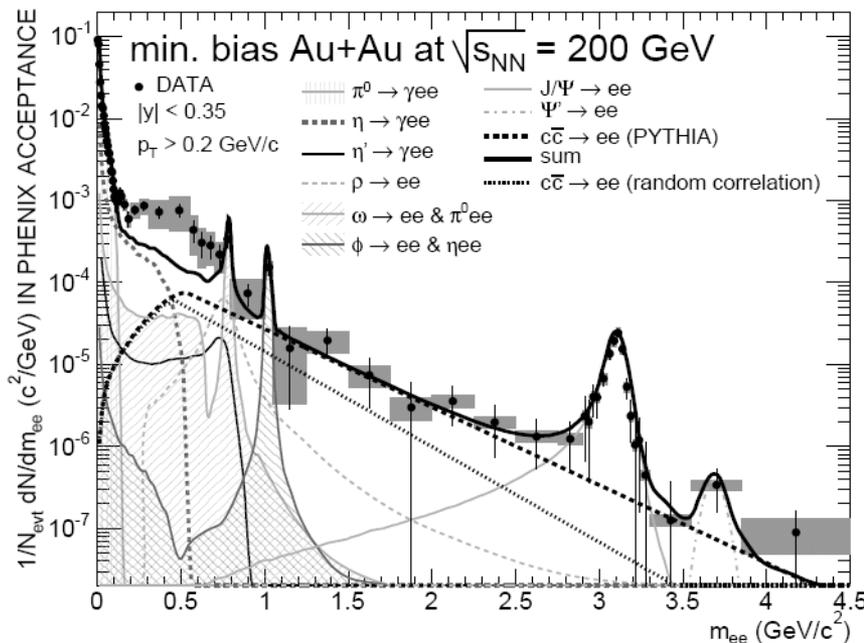
0.5 weeks @ 1/3 integer working point

4 weeks @ 7 GeV

2 weeks @ 11 GeV

0.5 weeks @ 5 GeV study

Dilepton Physics @ 62 GeV



PHENIX Run-04 AuAu 200 GeV arXiv:0706.3034

In contrast, in the range from 150 to 750 MeV/c², the observed yield rises significantly compared to the expectation, reaching a factor of $7.7 \pm 0.6(\text{stat.}) \pm 2.5(\text{syst.}) \pm 1.5(\text{model})$ for most central collisions. The increase is qualitatively consistent with the conjecture that an in-medium enhancement of the dielectron continuum yield arises from scattering processes like $\pi\pi$ or $q\bar{q}$ annihilation, which would result in a yield rising faster than proportional to N_{part} .

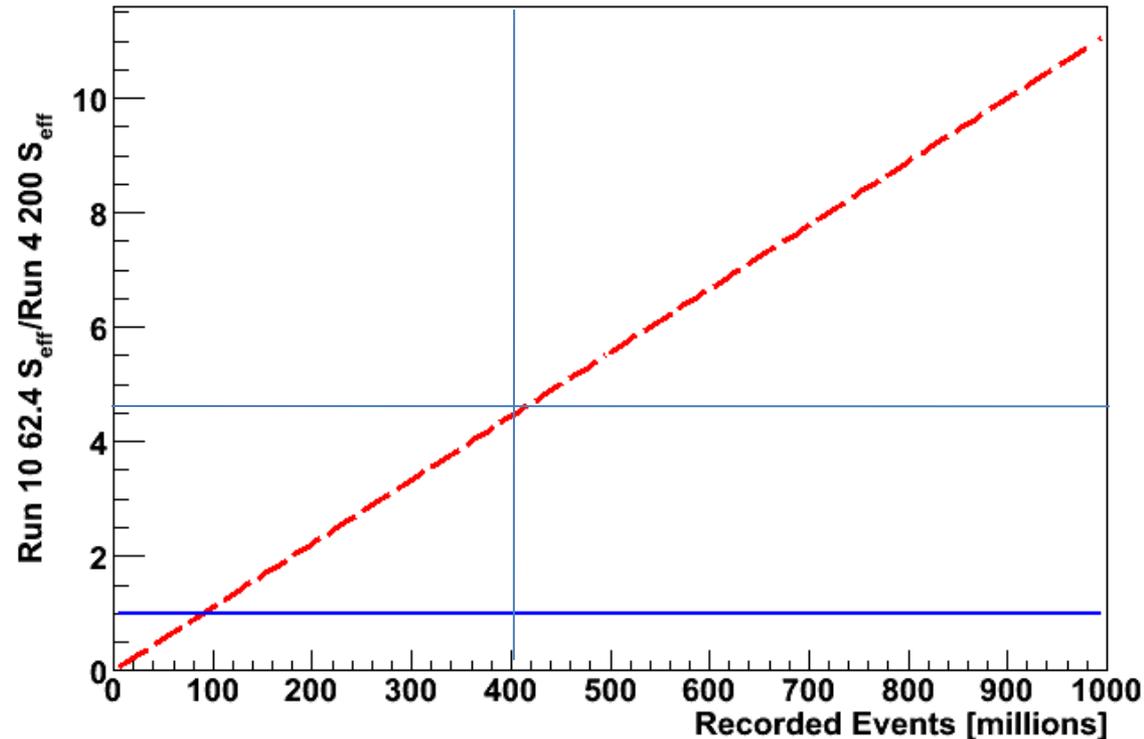
With 400 million recorded Au+Au @ 62 GeV minimum bias events ($64 \mu\text{b}^{-1}$) in PHENIX, if we assume a similar low mass enhancement to our published Run-04 Au+Au @ 200 GeV result, we will have an increase in the statistical significance of 2.

The Run-04 @ 200 GeV low mass enhancement is a 2.6 sigma effect.

Thus, the Run-10 @ 62 GeV result would be a 5.2 sigma effect.

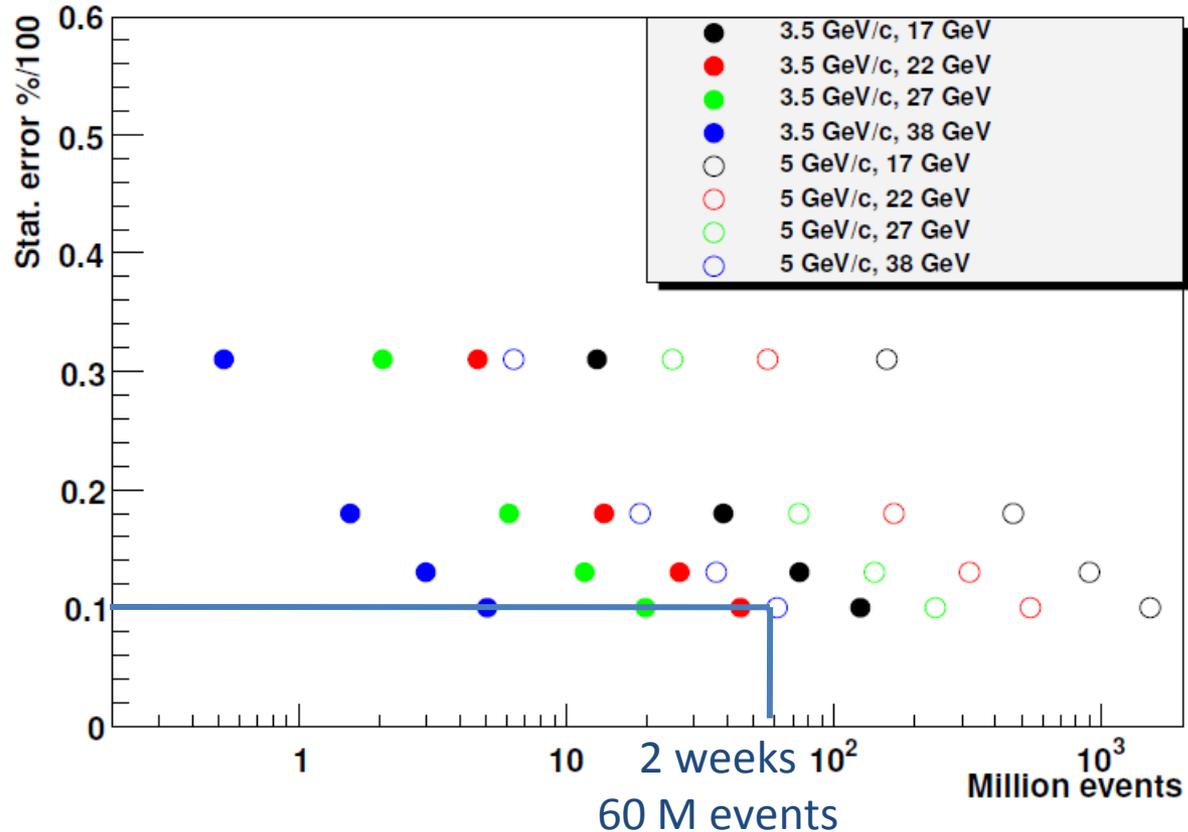
Dilepton physics @ 62 GeV

- S_{eff} : corresponding signal in background-free environment
- Significance: $S/\varepsilon(S) = \sqrt{S_{\text{eff}}}$
- Run-4: 1.5 G recorded events
- HBD increases S_{eff} by factor ~ 15 due to improved S/B
- 400 M AuAu@62.4 GeV events in Run-10 will yield
 - $4 \times S_{\text{eff}}(\text{Run4@200 GeV})$
 - 2 x 200 GeV significance (Run-4@200 GeV)



Light Quark R_{AA} @ 39 GeV

Events needed for given stat. precision light quark R_{AA}



PHENIX BUP

- asked for 1.6 weeks, 50 M events ($8\mu\text{b}^{-1}$)
 - to achieve 10-15% statistical uncertainty
 - pion R_{AA} at 5 GeV/c p_T