



X General Meeting Close out



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SLAC  *General Meeting*

October 9, 2009



A lot of progress in this meeting.

Activity toward the WHITE PAPER

We are moving toward a stable equilibrium point.

Still several open issues in front that should be solved soon, hopefully before Frascati General Meeting at the beginning of December.

Timing and purpose of White paper

TDR by the end of 2010.

Approval by the Italian Government is expected by the end of 2009.

In my close out of Perugia IX General Meeting I mentioned

“Intermediate Document” by the end of 2009 or anyway not much later than that.

The purpose of this document the WHITE PAPER is mainly for recruiting and to help SuperB communities in various regions in dealing with Funding Agencies for local approval and funding their participation to SuperB.

Format, language and figures should be appropriate for a Scientists audience, not necessarily experts of flavor physics or e^+e^- machines.

A lot of progress in organizing the effort during this meeting.

On Physics

Progress toward the White Paper.

Polarization group is in place, a big step forward to fully understand the added value of having one polarized beam. A critical evaluation of generators can help. Experimental sensitivities hopefully soon!

Simulations

A **big progress** on the Montecarlo production.

Plans for further increase in production capability in 2009.

Simulation group responded in a very effective way to the needs of the community.

The Geometry Working Group is very active.

Detector

From presentations this morning we had the summaries on the various subdetectors.

So far so good. Good organization for White Paper.

Programs for R&D.

Of course lack of man power as all the other areas

But..

Open issues

Close on geometry.

Open issues

Close on geometry.



Open issues

Close on geometry.



Background:

In particular the luminosity related Background.

Problems mainly with Vertex detection.

It is related to the design of the interaction, beam pipe radius, sensitivity in time dependent analysis and eventually to the machine boost.

How serious? How to solve it?

Is anything we can do for better understanding
Background? Better simulation of pairs
production?

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**EASY solution : increase boost, increase beam
pipe radius.**

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**EASY solution : increase boost, increase beam
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But MACHINE



OTHER SOLUTIONS?

Optimize the interaction region adding locally
Magnetic Field?

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But add also locally a magnetic non
homogeneity in the tracking region

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MACHINE

- We have now a reasonable design for a “short machine” 1325 m.
- This design is of course site independent.

Super-B Parameter Options

(John presentation last Tuesday)

LER/HER	Unit	June 2008	Jan. 2009	March 2009	LNF site
E+/E-	GeV	4/7	4/7	4/7	4/7
L	cm ⁻² s ⁻¹	1x10 ³⁶	1x10 ³⁶	1x10 ³⁶	1x10 ³⁶
I+/I-	Amp	1.85 /1.85	2.00/2.00	2.80/2.80	2.70/2.70
N _{part}	x10 ¹⁰	5.55 /5.55	6/6	4.37/4.37	4.53/4.53
N _{bun}		1250	1250	2400	1740
I _{bunch}	mA	1.48	1.6	1.17	1.6
θ/2	mrad	25	30	30	30
β _x *	mm	35/20	35/20	35/20	35/20
β _y *	mm	0.22 /0.39	0.21 /0.37	0.21 /0.37	0.21 /0.37
ε _x	nm	2.8/1.6	2.8/1.6	2.8/1.6	2.8/1.6
ε _y	pm	7/4	7/4	7/4	7/4
σ _x	μm	9.9/5.7	9.9/5.7	9.9/5.7	9.9/5.7
σ _y	nm	39/39	38/38	38/38	38/38
σ _z	mm	5/5	5/5	5/5	5/5
ξ _x	X tune shift	0.007/0.002	0.005/0.0017	0.004/0.0013	0.004/0.0013
ξ _y	Y tune shift	0.14 /0.14	0.125/0.126	0.091/0.092	0.094/0.095
RF stations	LER/HER	5/6	5/6	5/8	6/9
RF wall plug power	MW	16.2	18	25.5	30.
Circumference	m	1800	1800	1800	1400

Super-B Parameter Options

(John presentation last Tuesday)

+

the new study

LER/HER	Unit	June 2008	Jan. 2009	March 2009	LNF site	July 2009
E+/E-	GeV	4/7	4/7	4/7	4/7	4.18/6.7
L	cm ⁻² s ⁻¹	1x10 ³⁶	1x10 ³⁶	1x10 ³⁶	1x10 ³⁶	1x10 ³⁶
I+/I-	Amp	1.85 /1.85	2.00/2.00	2.80/2.80	2.70/2.70	2.12/2.12
N _{part}	x10 ¹⁰	5.55 /5.55	6/6	4.37/4.37	4.53/4.53	5.7/5.7
N _{bun}		1250	1250	2400	1740	1011
I _{bunch}	mA	1.48	1.6	1.17	1.6	
θ/2	mrad	25	30	30	30	
β _x *	mm	35/20	35/20	35/20	35/20	
β _y *	mm	0.22 /0.39	0.21 /0.37	0.21 /0.37	0.21 /0.37	
ε _x	nm	2.8/1.6	2.8/1.6	2.8/1.6	2.8/1.6	
ε _y	pm	7/4	7/4	7/4	7/4	
σ _x	μm	9.9/5.7	9.9/5.7	9.9/5.7	9.9/5.7	
σ _y	nm	39/39	38/38	38/38	38/38	
σ _z	mm	5/5	5/5	5/5	5/5	
ξ _x	X tune shift	0.007/0.002	0.005/0.0017	0.004/0.0013	0.004/0.0013	0.0045/0.0017
ξ _y	Y tune shift	0.14 /0.14	0.125/0.126	0.091/0.092	0.094/0.095	0.1170/0.1170
RF stations	LER/HER	5/6	5/6	5/8	6/9	
RF wall plug power	MW	16.2	18	25.5	30.	17.0
Circumference	m	1800	1800	1800	1400	1315

From July 2008 Mini-MAC

Possible scenarios for 10^{36} (LER/HER)

	Unit	CDR 2007	June 2008	$\epsilon_y \times 2$	$\epsilon_y \times 4$	ϵ_y & β_y^* higher	β_y^* higher	σ_z longer	σ_z shorter	ξ_y 0.085
I^+ / I^-	Amp	2.28 /1.30	1.85 /1.85	2.28 /1.30	2.28 /1.30	4.56 /2.60	3.42 /1.95	2.28 /1.30	2.28 /1.30	4.56 /2.60
N_{part}	$\times 10^{10}$	6.16 /3.52	5.52 /5.52	8.71 /4.98	12.4 /7.0	6.16 /3.52	5.0 /2.87	12.4 /7.0	3.1 /1.26	6.16 /3.52
N_{bun}		1250	1250	884	625	2500	2296	625	2500	2500
β_y^*	mm	0.3 /0.3	0.22 /0.39	0.3 /0.3	0.3 /0.3	0.6 /0.6	0.45 /0.45	0.3 /0.3	0.3 /0.3	0.3 /0.3
ϵ_y	pm	4/4	7/4	8/8	16/16	8/8	4/4	4/4	4/4	16/16
σ_y	nm	35/35	39/39	49/49	70/70	70/70	42/42	35/35	35/35	70/70
ξ_y	Tune shift	0.17 /0.17	0.15 /0.15	0.17 /0.17	0.17 /0.17	0.17 /0.17	0.17 /0.17	0.17 /0.17	0.17 /0.17	0.085 /0.085
σ_z	mm	6/6	6/6	6/6	6/6	6/6	6/6	12/12	3/3	6/6

Several parameter sets allow to reach 10^{36} .
No scenario has all parameters pushed to limit

Lower ξ_y



J. Seeman, MiniMac, LNF, July 2008 Workshop, January. 26th 2009



PARAMETER REQUIREMENTS FROM PHYSICS

Parameter	Requirement	Comment
Luminosity (top-up mode)	$10^{36} \text{ cm}^{-2}\text{s}^{-1}$ @ $Y(4S)$	Baseline/Flexibility with headroom at $4 \cdot 10^{36} \text{ cm}^{-2}\text{s}^{-1}$
Integrated luminosity	75 ab^{-1}	Based on a “New Snowmass Year” of 1.5×10^7 seconds (PEP-II & KEKB experience-based)
CM energy range	τ threshold to $Y(5S)$	For Charm special runs.....
Minimum boost	$\beta\gamma \approx 0.28$ $\approx (4 \times 7 \text{ GeV})$	1 cm beam pipe radius. First measured point at 1.5 cm
e^- Polarization	60-85%	Enables τ CP and T violation studies, measurement of $\tau g-2$ and improves sensitivity to lepton flavor-violating decays. Detailed simulation, needed to ascertain a more precise requirement, are in progress.

Sasha Novokhatski "RF/Impedance"

HER	HER	HER	HER	HER	HER	HER	HER	HER	HER	HER	HER	HER	HER	HER	HER	HER	HER+
S.R. energy					Total	Zero I	Max	Number				Total	Total	Total	Power for	LER	
Lumi	Beam	Beam	loss	Momen-	Momen-	RF	Bunch	Bunch	voltage	of	S.R.	HOM	cavity	reflected	forward	one	Total
energy	current	per turn	um com-	tum	voltage	length	pacing	er cavit	cavities	power	power	loss	power	power	cavity	forward	
GeV	A	MeV	paction	spread	MV	mm	nsec	MV	klystro	MW	MW	MW	MW	MW	MW	MW	MW
1E+36	6.7	2.12	2.03	4.0E-04	6.2E-04	5.7	5.0	4.2	0.4	14	4.3036	0.4611	0.58	0.2858	5.63	0.40	8.53
										7							
1E+36	6.7	2.12	2.03	4.0E-04	6.2E-04	7	4.5	4.2	0.5	14	4.3036	0.5411	0.875	0.0299	5.75	0.41	8.84
										7							
LER	LER	LER	LER	LER	LER	LER	LER	LER	LER	LER	LER	LER	LER	LER	LER	LER	HER+
S.R. energy					Total	Zero I	Max	Number				Total	Total	Total	Power for	Supply	
Lumi	Beam	Beam	loss	Momen-	Momen-	RF	Bunch	Bunch	voltage	of	S.R.	HOM	cavity	reflected	forward	one	Power
energy	current	per turn	um com-	tum	voltage	length	pacing	er cavit	cavities	power	power	loss	power	power	cavity	eff.~50%	
GeV	A	MeV	paction	spread	MV	mm	nsec	MV	klystro	MW	MW	MW	MW	MW	MW	MW	MW
1E+36	4.18	2.12	0.83	4.2E-04	6.6E-04	4.1	5.0	4.2	0.65	6	1.7596	0.3836	0.7	0.0533	2.90	0.48	17.05
										3							
1E+36	4.18	2.12	0.83	4.2E-04	6.6E-04	5	4.5	4.2	0.65	8	1.7596	0.4694	0.781	0.0763	3.09	0.39	17.67
										4							

On the table of Project Board this Saturday

Definition of the Change Control Procedure.

Goals for December LNF Meeting:

Manpower issues.

Optimization of machine.

Detector studies.

Be prepared for a possible announcement of approval.

Change Control

- Once some parameter list has been agreed upon and evaluated and approved by the appropriate Review committee (es: MiniMac)
- Parameters can be changed once proposed by the System (es: computing, detector...), after a careful evaluation of advantages and disadvantages under the control of the Project Board.
- **Decisions will be taken by consensus and presented by the Director to the community.**

On the table of Project Board this Saturday

Machine optimization as a **site-independent** study

- Evaluation of luminosity headroom (luminosity upgradability)
- Flexibility in parameters to reach the luminosity goals as done for miniMAC with the larger machine is a requirement
- Evaluation of the wallplug power of different configurations
- Polarization & polarization effects on the lattice and luminosity

How do we accomplish these goals soon, possibly by the December Meeting in Frascati and on a time scale that allows a new miniMAC review in the Spring?

Super*B* meetings

2009

2010

Calendar to be fixed by the Steering Committee in 2 weeks

January							February							March						
Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa
					1	2		1	2	3	4	5	6		1	2	3	4	5	6
3	4	5	6	7	8	9	7	8	9	10	11	12	13	7	8	9	10	11	12	13
10	11	12	13	14	15	16	14	15	16	17	18	19	20	14	15	16	17	18	19	20
17	18	19	20	21	22	23	21	22	23	24	25	26	27	21	22	23	24	25	26	27
24	25	26	27	28	29	30	28							28	29	30	31			
31																				

April							May							June						
Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa
				1	2	3							1			1	2	3	4	5
4	5	6	7	8	9	10	2	3	4	5	6	7	8	6	7	8	9	10	11	12
11	12	13	14	15	16	17	9	10	11	12	13	14	15	13	14	15	16	17	18	19
18	19	20	21	22	23	24	16	17	18	19	20	21	22	20	21	22	23	24	25	26
25	26	27	28	29	30		23	24	25	26	27	28	29	27	28	29	30			
							30	31												

July							August							September						
Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa
				1	2	3	1	2	3	4	5	6	7				1	2	3	4
4	5	6	7	8	9	10	8	9	10	11	12	13	14	5	6	7	8	9	10	11
11	12	13	14	15	16	17	15	16	17	18	19	20	21	12	13	14	15	16	17	18
18	19	20	21	22	23	24	22	23	24	25	26	27	28	19	20	21	22	23	24	25
25	26	27	28	29	30	31	29	30	31					26	27	28	29	30		

October							November							December						
Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa
				1	2	3	1	2	3	4	5	6	7			1	2	3	4	5
4	5	6	7	8	9	10	8	9	10	11	12	13	14	6	7	8	9	10	11	12
11	12	13	14	15	16	17	15	16	17	18	19	20	21	13	14	15	16	17	18	19
18	19	20	21	22	23	24	22	23	24	25	26	27	28	20	21	22	23	24	25	26
25	26	27	28	29	30	31	29	30						27	28	29	30	31		

October							November							December										
Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa				
					1	2							1	2							1	2	3	4
3	4	5	6	7	8	9	7	8	9	10	11	12	13	5	6	7	8	9	10	11				
10	11	12	13	14	15	16	14	15	16	17	18	19	20	12	13	14	15	16	17	18				
17	18	19	20	21	22	23	21	22	23	24	25	26	27	19	20	21	22	23	24	25				
24	25	26	27	28	29	30	28	29	30					26	27	28	29	30	31					
31																								

Annecy

Elba

SLAC

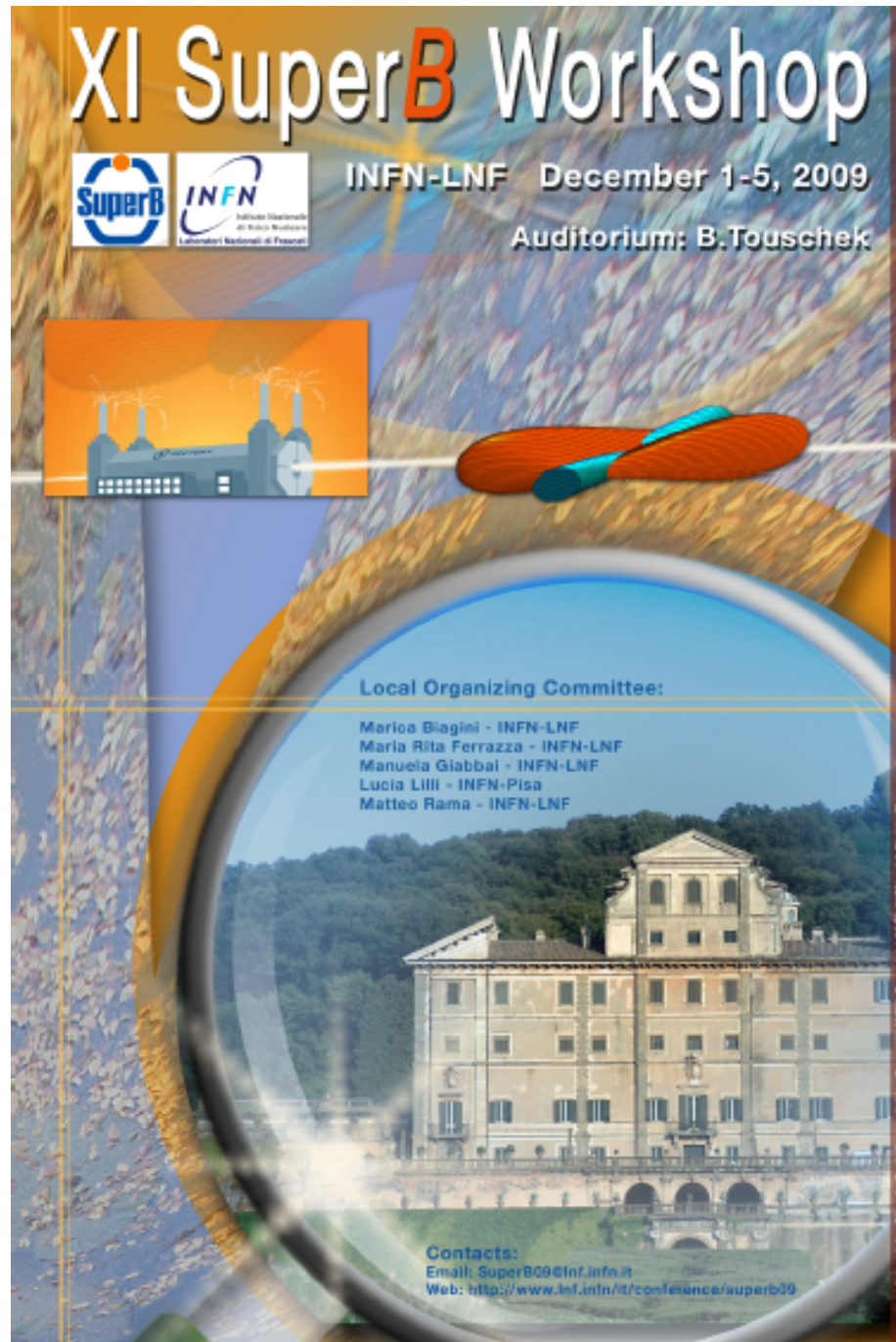
Frascati

"Frascati"

Caltech

Travel safely back home
and see you soon in
Frascati

Please
visit the
WEB site
and
Register!



The poster features a background of a particle detector's inner structure. At the top, the title 'XI SuperB Workshop' is written in a large, white, sans-serif font. Below the title are the logos for SuperB and INFN (Istituto Nazionale di Fisica Nucleare). To the right of the logos, the text 'INFN-LNF December 1-5, 2009' and 'Auditorium: B.Touschek' is displayed. A central graphic shows a stylized particle detector component. Below this, a circular inset shows a photograph of a large, classical-style building with a dome, surrounded by greenery. At the bottom of the poster, contact information is provided.

XI SuperB Workshop

SuperB INFN Istituto Nazionale di Fisica Nucleare Laboratori Nazionali di Frascati

INFN-LNF December 1-5, 2009
Auditorium: B.Touschek

Local Organizing Committee:
Marica Biagini - INFN-LNF
Maria Rita Ferrazza - INFN-LNF
Manuela Giabba - INFN-LNF
Lucia Lilli - INFN-Pisa
Matteo Rama - INFN-LNF

Contacts:
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Artwork by Claudio Focci - INFN - Anni Focci - INFN - Contrasti - INFN - AI 2009 - Biagini

Travel safely back home
and we all...

Wait for Government Decision