

## The Energy Spectrometer

Spokesman from the JINR: V.N.Duginov  
Co-spokesman of Germany: H.J. Schreiber (DESY Zeuthen)

### Main Results in 2003

The main activity in 2003 was concentrated on discussions and simulations of the magnet spectrometer, positioned upstream of the interaction point (IP). This topics covered in this work were

Magnets of the spectrometer;  
Beam position monitors;  
Slow control and the alignment of the spectrometer elements;  
Application of the synchrotron radiation for either absolute beam energy measurements of  $\Delta E/E \sim 10^{-4}$  or relative energy measurement down to  $10^{-5}$ .  
Application of other techniques (resonance absorption of laser light by the beam electrons within a static magnetic field and the beam energy measurement using radiative return events).

The main progress was achieved in the simulation of the spectrometer magnet and the results obtained were published.  
In the frames of this activity two meetings were organized, one in Zeuthen and one in Dubna. The specialists from DLNP JINR N. Morozov and I. Titkova visited DESY Zeuthen for 3D simulations of the spectrometer magnets using the computers and program package MAFIA at DESY.

### Publications in 2003

- 1) N.A. Morozov, H.J. Schreiber, "Magnetic field calculations for the technical proposal of the TESLA spectrometer magnet", JINR Communication E9-2003-65, Dubna, 2003.
- 2) talk by H.J. Schreiber at the LC workshop, Amsterdam, April 1-4, 2003.
- 3) talk by H.J. Schreiber at the LC workshop, Montpellier, November 13-16, 2003.

### Table of expenditures within the project in 2003

N	Item of expenditures	Subtotal (kE)		Realization stage
		Planned	Real	
1	Workshops (10 persons)			realized
2	Working visits to DESY and JINR (5 persons)			realized
	Total	5		

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The main task in 2004 will be the preparation of the Technical Design Report on the magnetic spectrometer. It needs several visits of the experts for discussions of the different aspects of the document. This work is expected to be

finished in July 2004, including complementary methods for measuring the beam energy as mentioned above.

In parallel with it, preliminary activities on the preparation of instrumentation for the spectrometer will be started. Feasibility studies of the magnetic field stabilization, the spectrometer alignment and the detection of the synchrotron radiation will be performed.

These activities have also been agreed within an attachment of the agreement between DLNP JINR and DESY.

Resources required in 2004 year funding from BMBF:

Purchase of material and equipment:

15 T Euro

Scientific missions:

10 T Euro

Specification of required equipment and materials

N	Equipment	Firm	Price (kE)	Q-ty	Sum (kE)
1	Digital multimeter HP-34401A	HP/USA	2	1	2
2	Digital Oscilloscope TDS3032	Tektronix/USA	5.3	1	5.3
3	NMR Magnetometer	JINR/Dubna	5	1	5
4	Hall Magnetometer	Tekona/RUS	0.8	1	0.8
5	PC, Pentium IV		1.5	1	1.5
6	Components		0.4		0.4
			Total:		15

Scientific missions

N	Item of expenditures	Sum (kE)
1	Workshops and ECFA-2004	8
2	Working visits to DESY and JINR	2
	Total	10