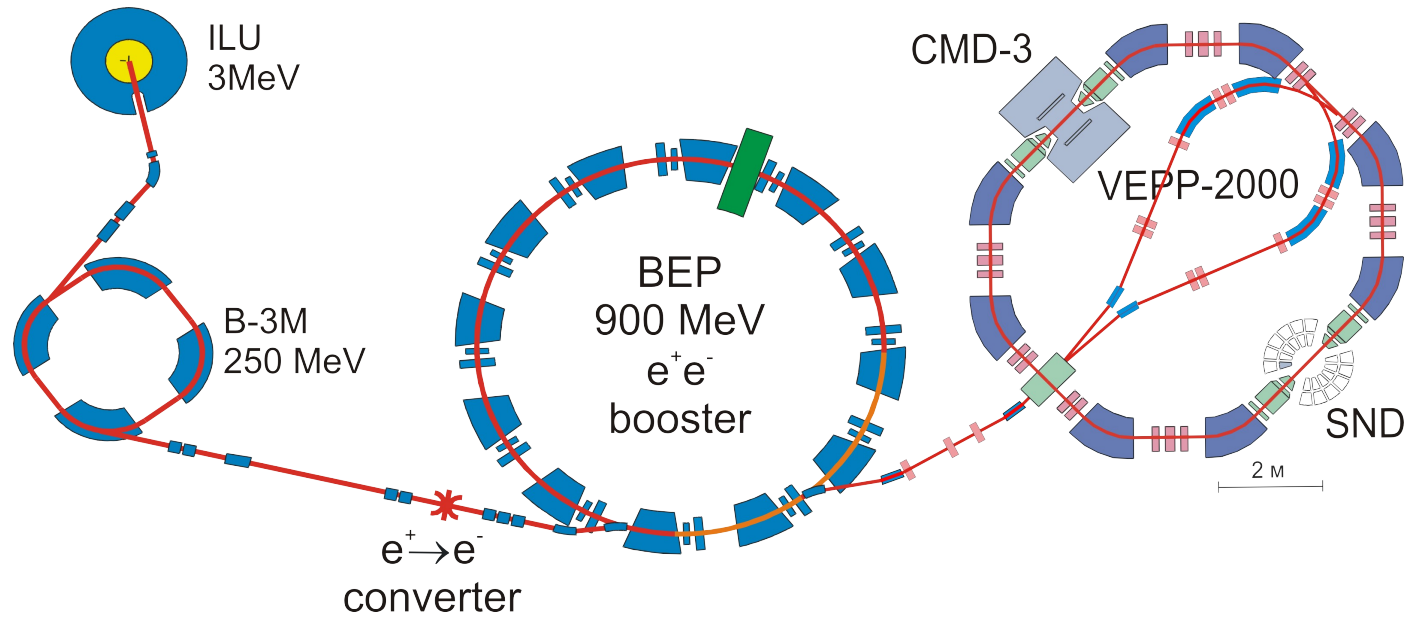


VEPP-2000 COLLIDER CONTROL SYSTEM

A.Senchenko, D.Berkaev, O.Gorbatenko, A.Kasaev, I.Koop, V.Kozak, A.Kyrpotin,
A. Lysenko, Yu. Rogovsky, A.Romanov, P. Shatunov, A. Stankevich, Yu. Shatunov
BINP SB RAS, Novosibirsk, Russia
Novosibirsk State University, Novosibirsk, Russia

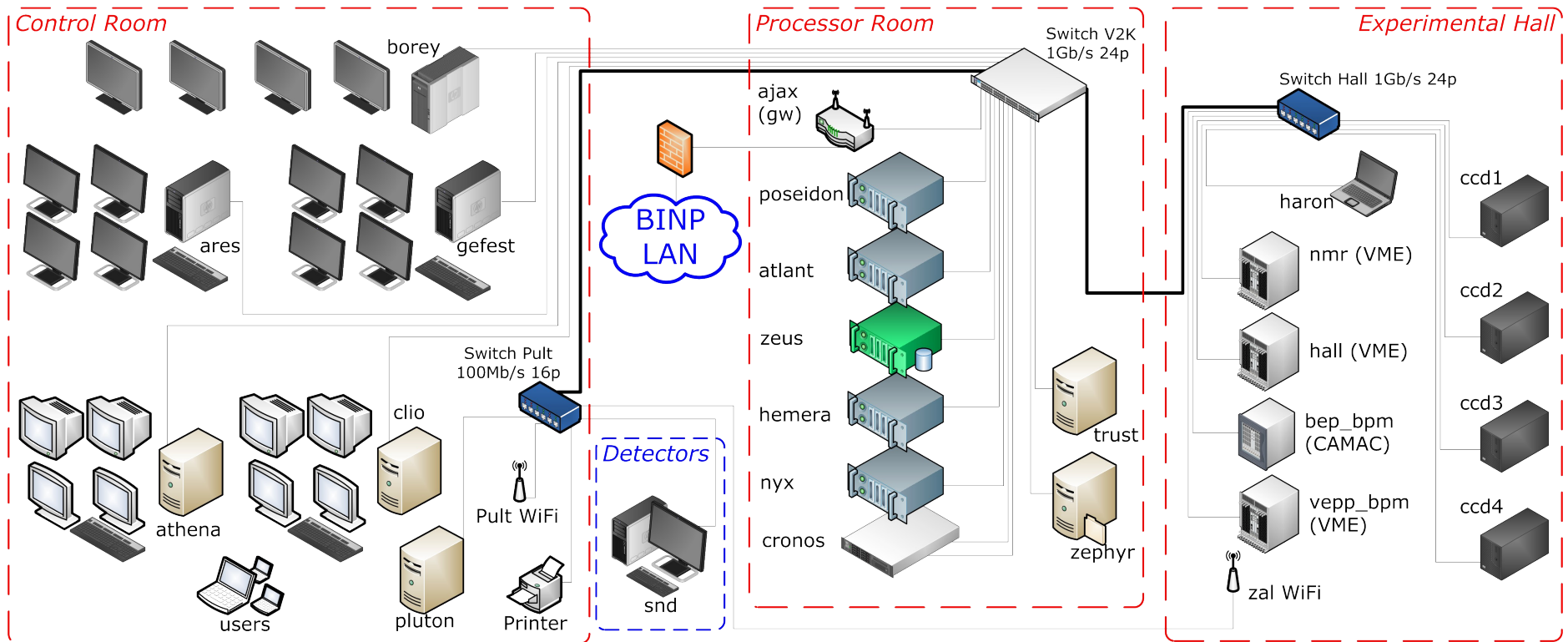


VEPP-2000 PROJECT

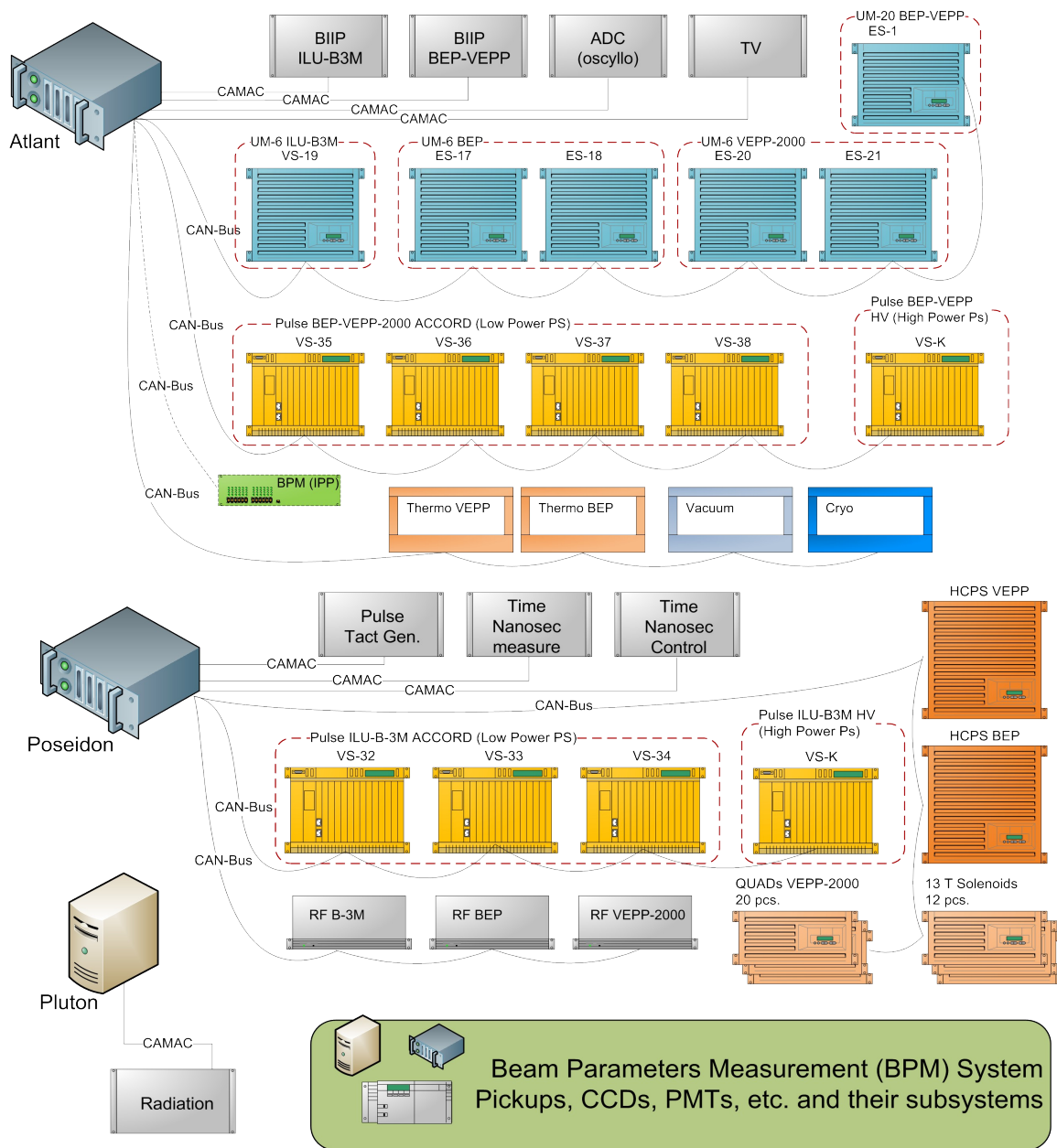


Circumference, Π	24.39
Energy, E	1 GeV
Betatron functions at IP, $\beta_{x,z}^*$	10 cm
Betatron tunes, $\nu_{x,z}$	4.1, 2.1
Beam emittance, ϵ	$1.4 \cdot 10^{-7}$ m*rad
Particles per beam, N	$1 \cdot 10^{11}$
Beam-beam parameters, ξ	0.075
Luminosity, L	10^{32} cm ⁻² s ⁻¹

CONTROL SYSTEM



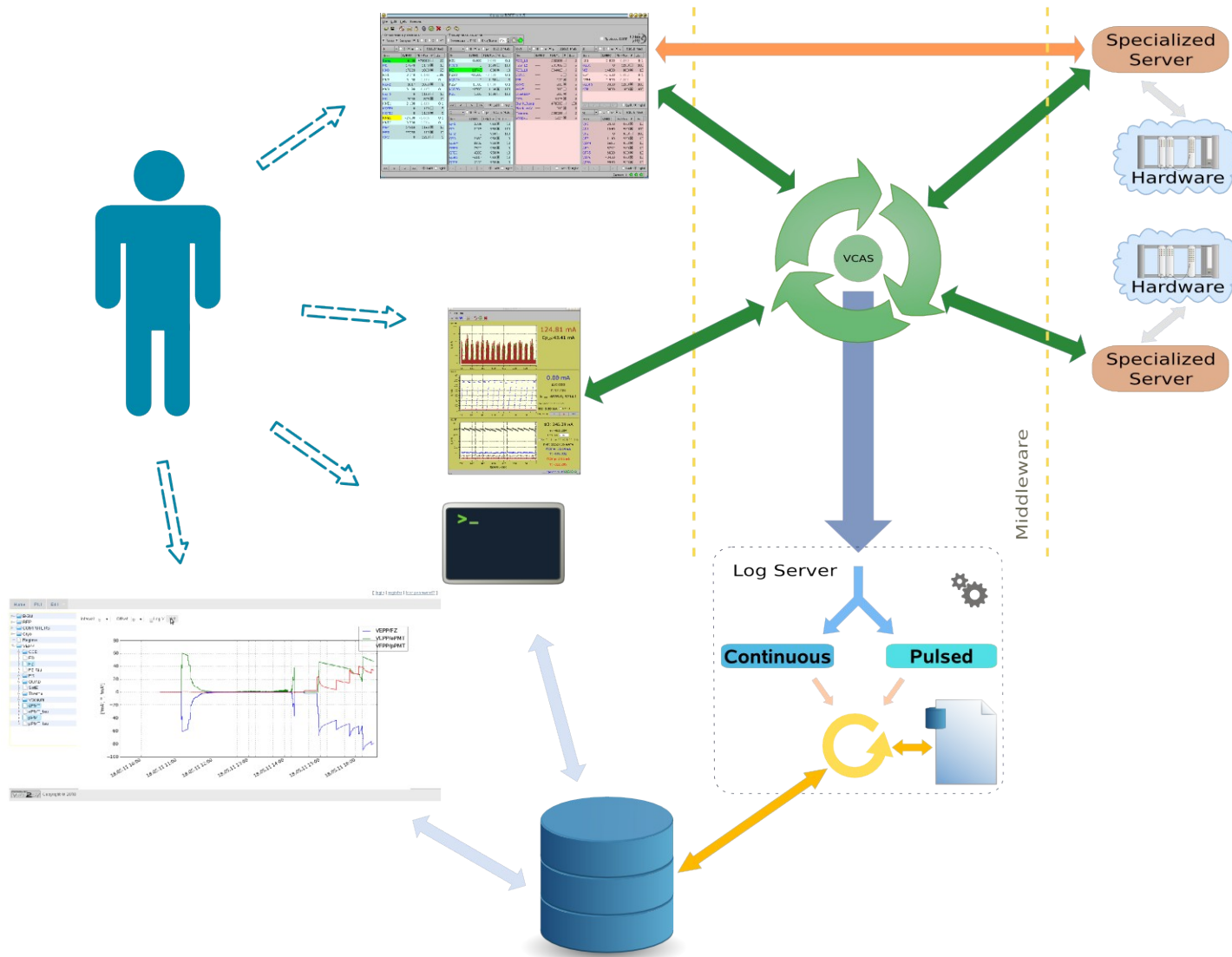
VEPP-2000 HARDWARE



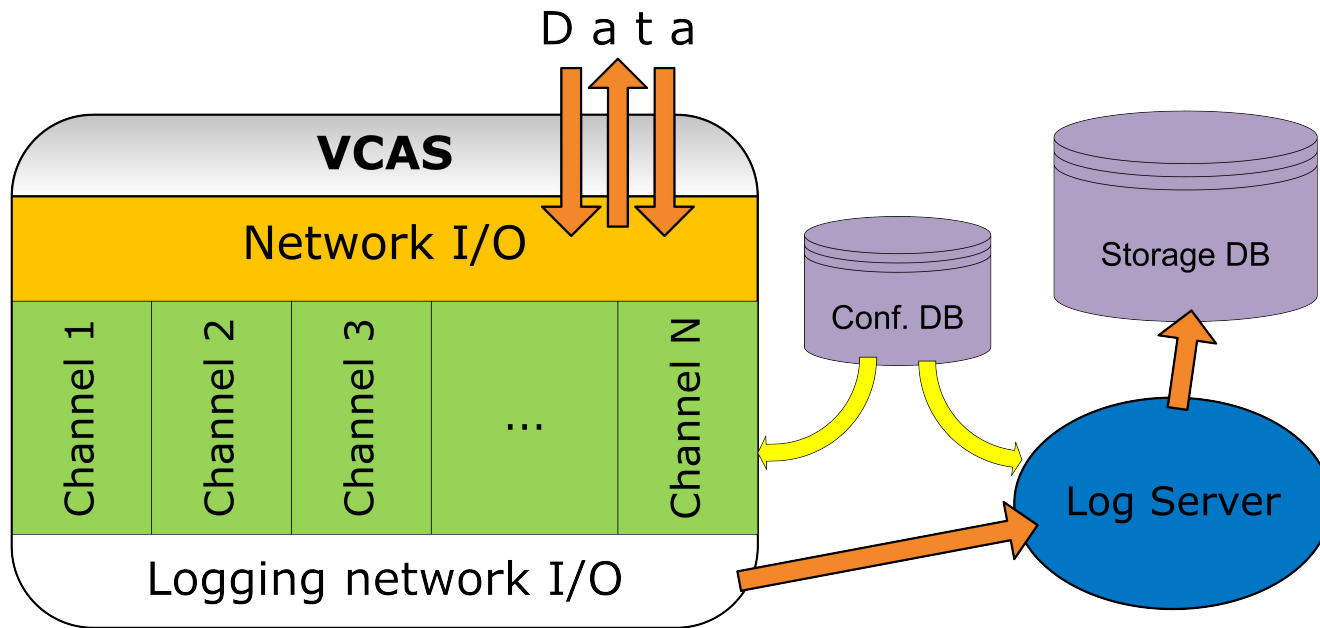
System	Subsystem	Protocol	N of channels
ILU & channel	Pulse DC	CAMAC	50
		CAN-Bus	40
		CAN-Bus	40
B-3M & channel	Pulse DC RF	CAMAC	50
		CAN-Bus	40
		CAN-Bus	40
		CAN-Bus	20
BEP	Steady RF	CAN-Bus	500
		CAN-Bus	20
BEP-VEPP-2000 channels	Pulse DC	CAMAC	30
		CAN-Bus	100
		CAN-Bus	50
VEPP-2000	DC RF	CAN-Bus	500
		CAN-Bus	20
Technologica 1	Vacuum Temperature Cryogenics Radiation	CAN-Bus	50
		CAN-Bus	80
		CAN-Bus	50
		CAN-Bus	50
		CAMAC	10

Total number of channels: ~2000

VEPP-2000 SOFTWARE ARCHITECTURE



VCAS APPLICATION



name – unique channel name (unix path style)

cas_type – cas type (read/write,read-only,exclusive)

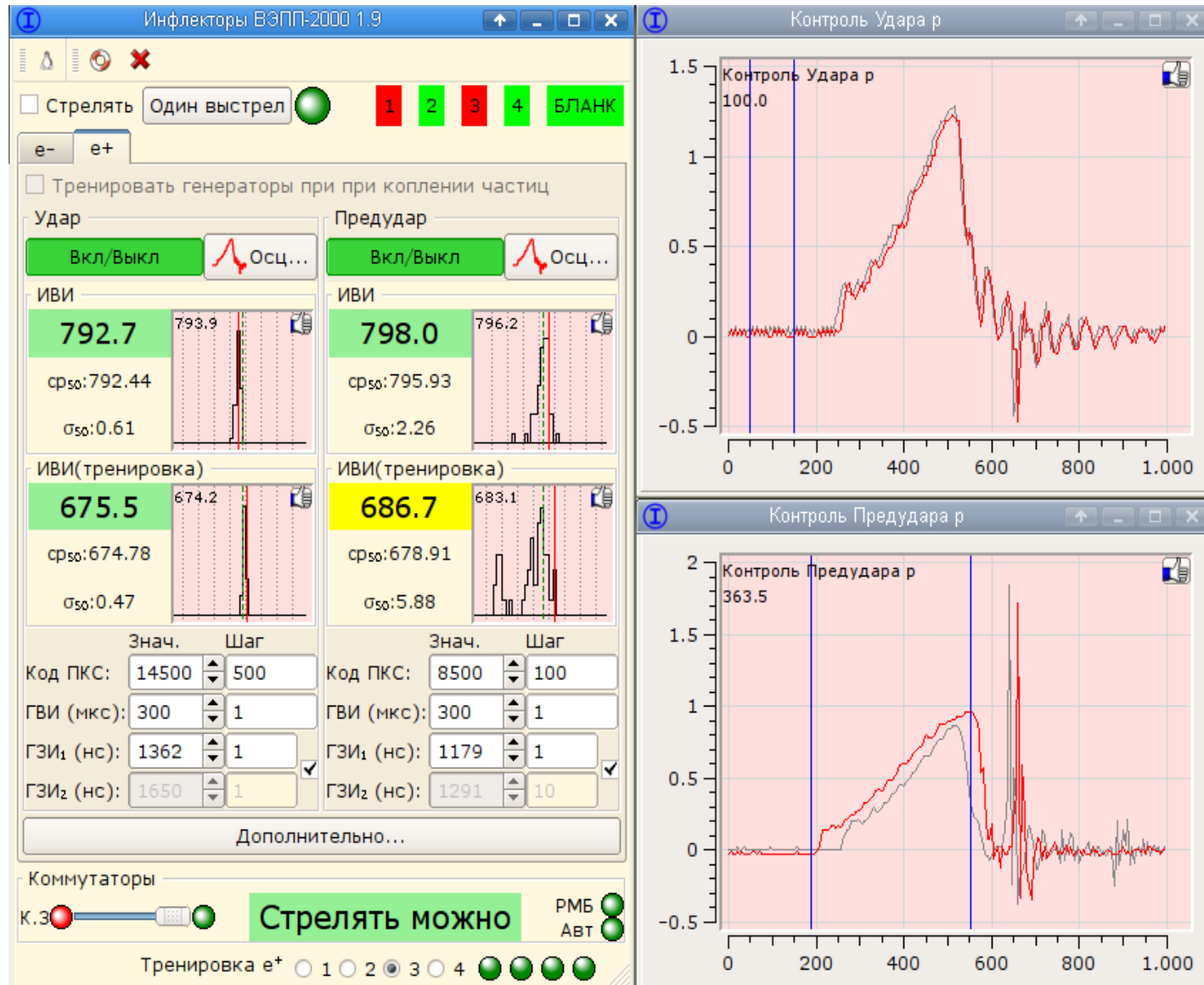
description – description of channel

units – channel units, if any

is_log – is channel loggable

GUI APPLICATION EXAMPLES

COLLIDER INFLECTORS



GUI APPLICATION EXAMPLES

CHANNEL CONFIGURATION

Каналы ВЭПП v.1.5

File Edit Help Каналы

Управление режимами: Авто Выпуск 1 2 3 4*

Тренировка каналов: Уменьшать ПКС Вкл/Выкл 10с Проброс ВЭПП

510.5 МэВ

Эл-т	I/ПКС	ГВИ/Ток	М	Шаг
Bump	-6100	479000	<input type="checkbox"/>	50
M1	17370	1170	<input checked="" type="checkbox"/>	10
KX0	-17223	1050	<input checked="" type="checkbox"/>	50
KX1	0.148	0.148	<input type="checkbox"/>	0.05
KM2	-3.100	-3.106	<input type="checkbox"/>	0.1
KQF2	1017	1050	<input checked="" type="checkbox"/>	5
KM3	0.190	0.187	<input type="checkbox"/>	0.1
KQF3	0	1180	<input type="checkbox"/>	10
MX	17030	875	<input checked="" type="checkbox"/>	10
KME1	2.100	2.106	<input type="checkbox"/>	0.1
KQFE4	0	1150	<input type="checkbox"/>	5
KQFE5	0	1150	<input checked="" type="checkbox"/>	5
KME2	-2.600	-2.615	<input type="checkbox"/>	0.1
KME3	-3.700	-3.704	<input type="checkbox"/>	0.1
ME4	14810	1160	<input checked="" type="checkbox"/>	10
ME5	27750	1160	<input checked="" type="checkbox"/>	10
ORB	0	1220	<input type="checkbox"/>	5

510.5 МэВ

Эл-т	I/ПКС	ГВИ/Ток	М	Шаг
KZ1	-0.900	-0.898	<input type="checkbox"/>	0.1
KQD1	0	1180	<input type="checkbox"/>	100
MZ	-13740	800	<input checked="" type="checkbox"/>	10
KZE3	-0.200	-0.198	<input type="checkbox"/>	0.1
KQDE4	0	1150	<input type="checkbox"/>	5
KZE4	1.900	1.900	<input type="checkbox"/>	0.1
KQDE6	-2800	1160	<input checked="" type="checkbox"/>	100
KZE	-1000	1180	<input type="checkbox"/>	100

510.5 МэВ

Эл-т	I/ПКС	ГВИ/Ток	М	Шаг
PZS_L1	---	502106	<input type="checkbox"/>	5
PZS_L2	---	501402	<input type="checkbox"/>	5
PZS_L3	---	504410	<input type="checkbox"/>	5
LGVI1	---	0	<input type="checkbox"/>	5
IPP	---	1850	<input checked="" type="checkbox"/>	5
WW6	---	200	<input checked="" type="checkbox"/>	5
WW5	---	200	<input type="checkbox"/>	5
StartBIIP	---	200	<input checked="" type="checkbox"/>	5
PZS	---	4125	<input checked="" type="checkbox"/>	5
Blank_Bump	---	478000	<input type="checkbox"/>	100
Blank_WW	---	1000	<input checked="" type="checkbox"/>	5
Training	---	500826	<input type="checkbox"/>	5
StopBIIP	---	1227	<input checked="" type="checkbox"/>	5

510.5 МэВ

Эл-т	I/ПКС	ГВИ/Ток	М	Шаг
KZ1	-0.800	-0.898	<input type="checkbox"/>	0.1
KQD1	0	1200	<input type="checkbox"/>	100
MZ	14030	800	<input checked="" type="checkbox"/>	10
KZ4	-0.500	0.002	<input type="checkbox"/>	0.1
KZP4	0.900	0.001	<input type="checkbox"/>	0.1
KQDP6	3300	1200	<input checked="" type="checkbox"/>	100
KZP	10000	1180	<input checked="" type="checkbox"/>	100

510.5 МэВ

Эл-т	I/ПКС	ГВИ/Ток	М	Шаг
QF1	2095	950	<input checked="" type="checkbox"/>	10
QD1	2675	950	<input checked="" type="checkbox"/>	100
QF2	0	950	<input type="checkbox"/>	100
QF3	2180	950	<input checked="" type="checkbox"/>	10
QDE4	-8632	950	<input checked="" type="checkbox"/>	10
QFE4	7520	950	<input checked="" type="checkbox"/>	10
QFE5	-4200	950	<input checked="" type="checkbox"/>	10
QDE6	-6117	950	<input checked="" type="checkbox"/>	10
QFE6	5350	950	<input checked="" type="checkbox"/>	10

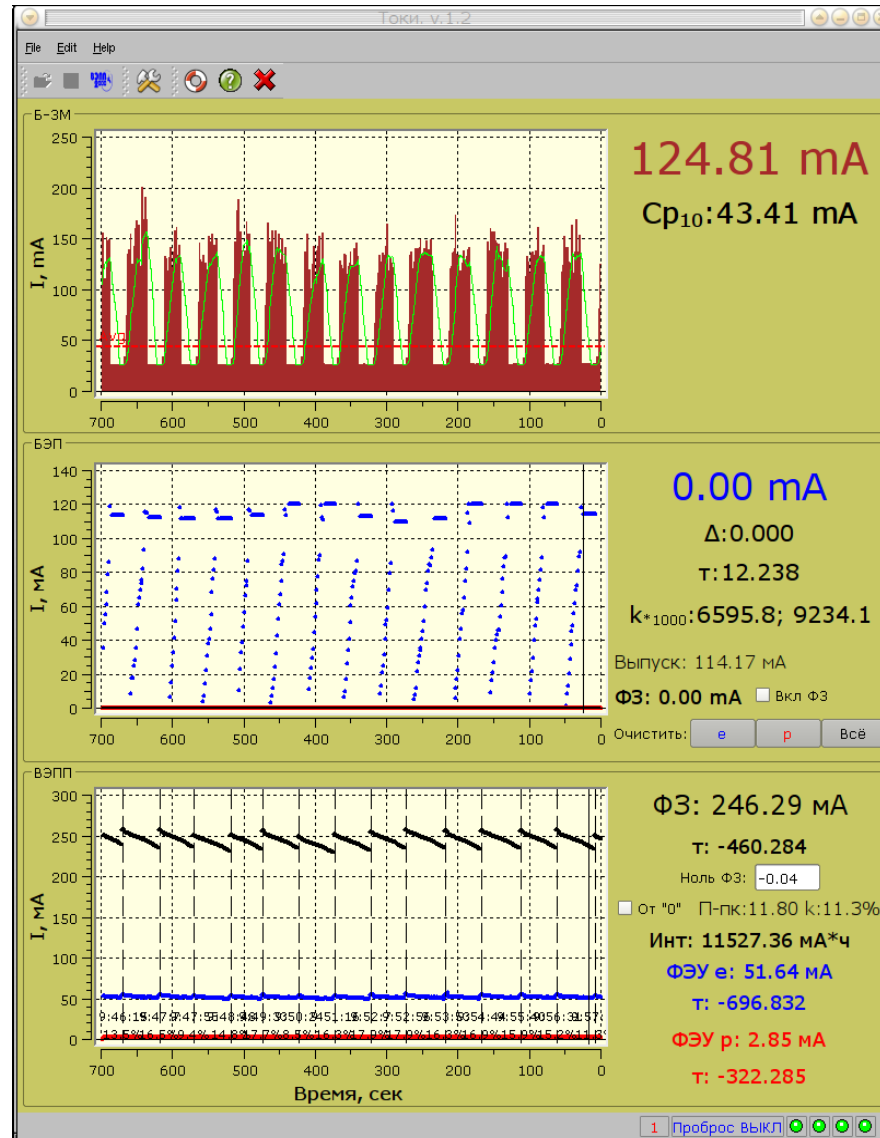
510.5 МэВ

Эл-т	I/ПКС	ГВИ/Ток	М	Шаг
QF1	2390	950	<input checked="" type="checkbox"/>	10
QD1	1640	950	<input checked="" type="checkbox"/>	100
QF2	0	950	<input type="checkbox"/>	100
QF3	1140	950	<input checked="" type="checkbox"/>	10
QDP4	-5665	950	<input checked="" type="checkbox"/>	10
QFP4	5722	950	<input checked="" type="checkbox"/>	10
QFP5	-6620	950	<input checked="" type="checkbox"/>	10
QDP6	-9400	950	<input checked="" type="checkbox"/>	10
QFP6	9960	950	<input checked="" type="checkbox"/>	10

Режим: 1

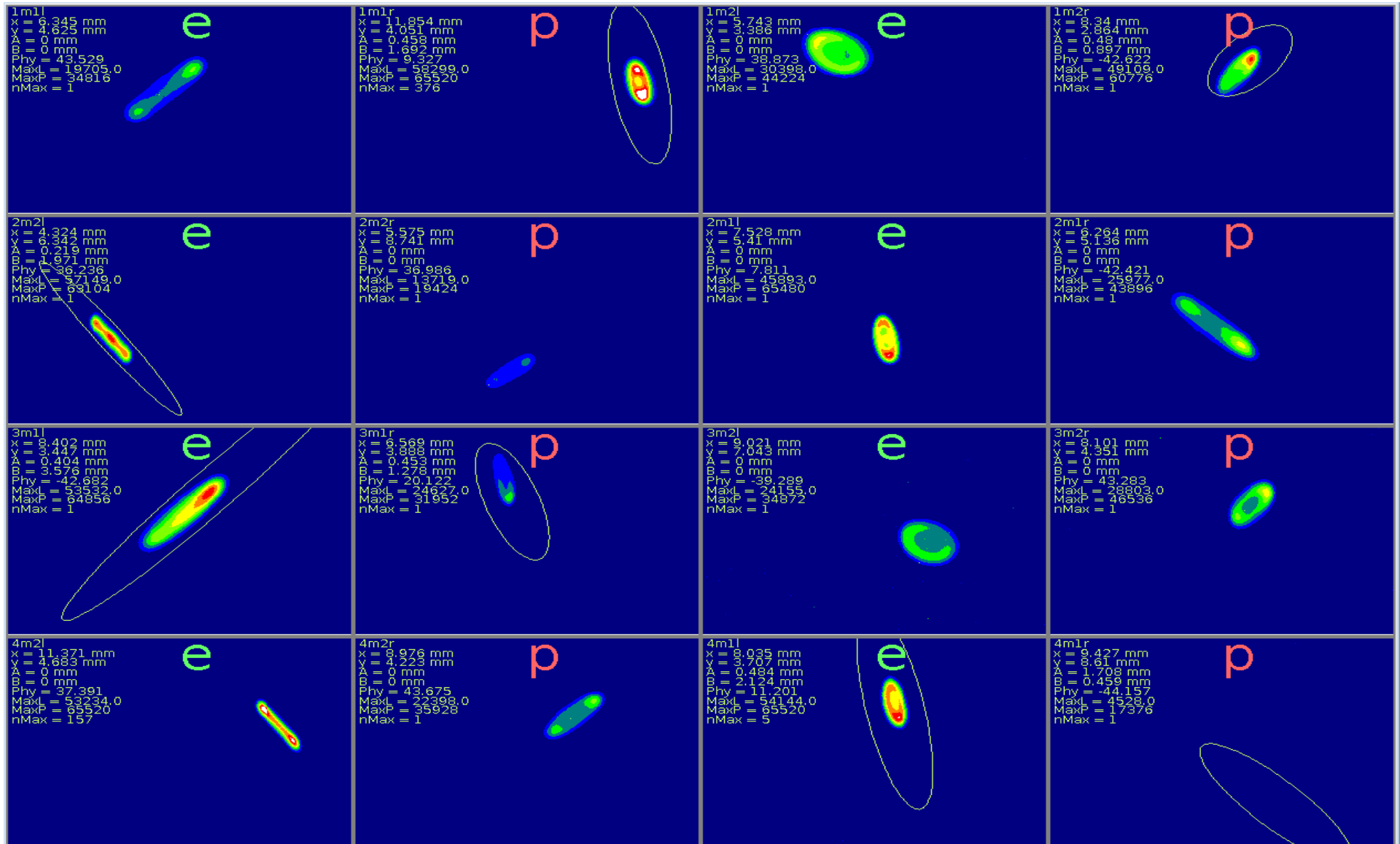
GUI APPLICATION EXAMPLES

VEPP2K CURRENTS



GUI APPLICATION EXAMPLES

CCD BEAM MONITORING



CONCLUSION

- VEPP-2000 automation system is based on made in BINP (Novosibirsk) hardware. Software system substantially corresponds to hardware system and has three-layer architecture.
- The separation of hardware peculiarities from GUI with so-called middleware allows to operator independently steering of different VEPP-2000 subsystems like ILU, B-3M and BEP, VEPP-2000 and beam channels.
- New VCAS application was specially designed to provide to other automation system programs universal communication media.
- Two experimental seasons in 2009-2012 have been done and two detectors SND and CMD-3 have collected about 30 pb^{-1} of integrated luminosity.



VEPP-2000 CONTROL ROOM