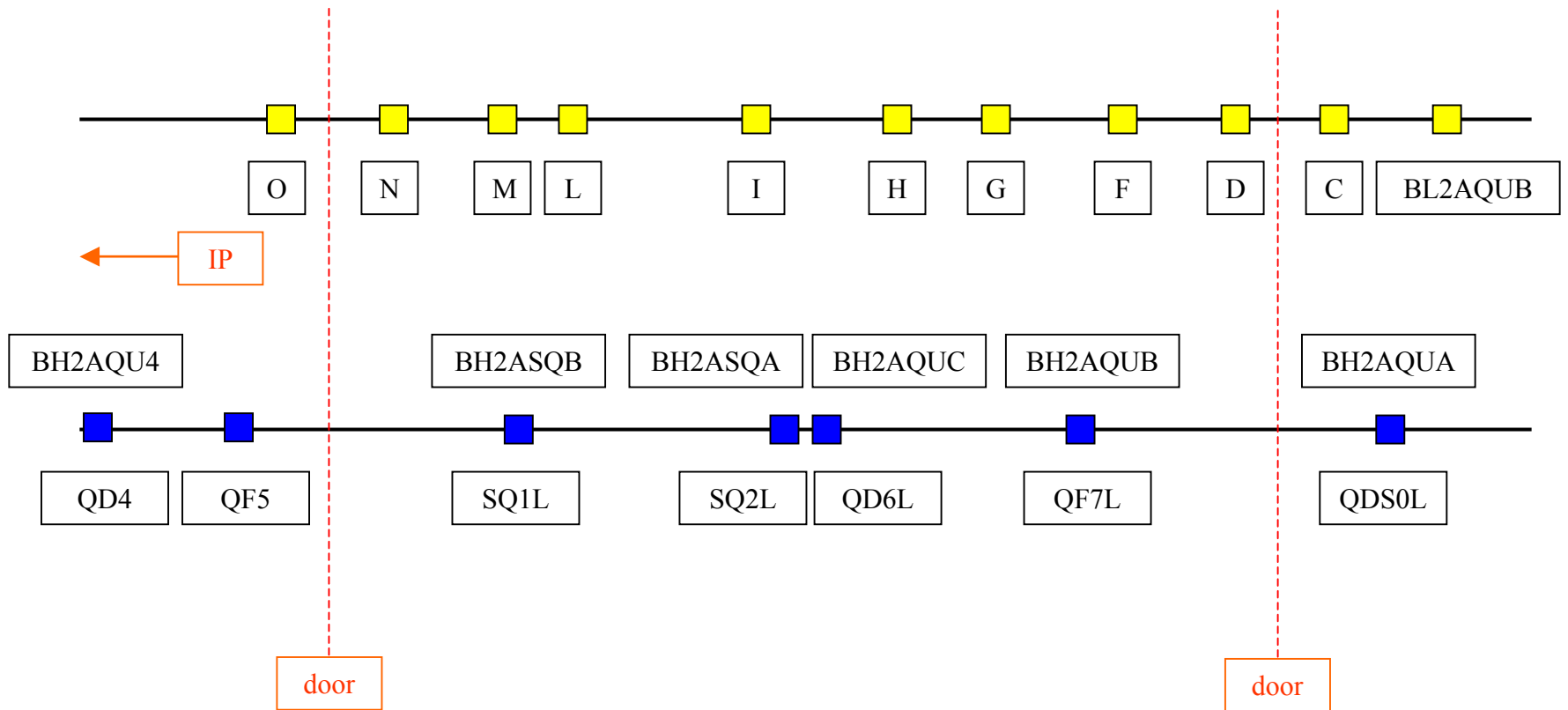


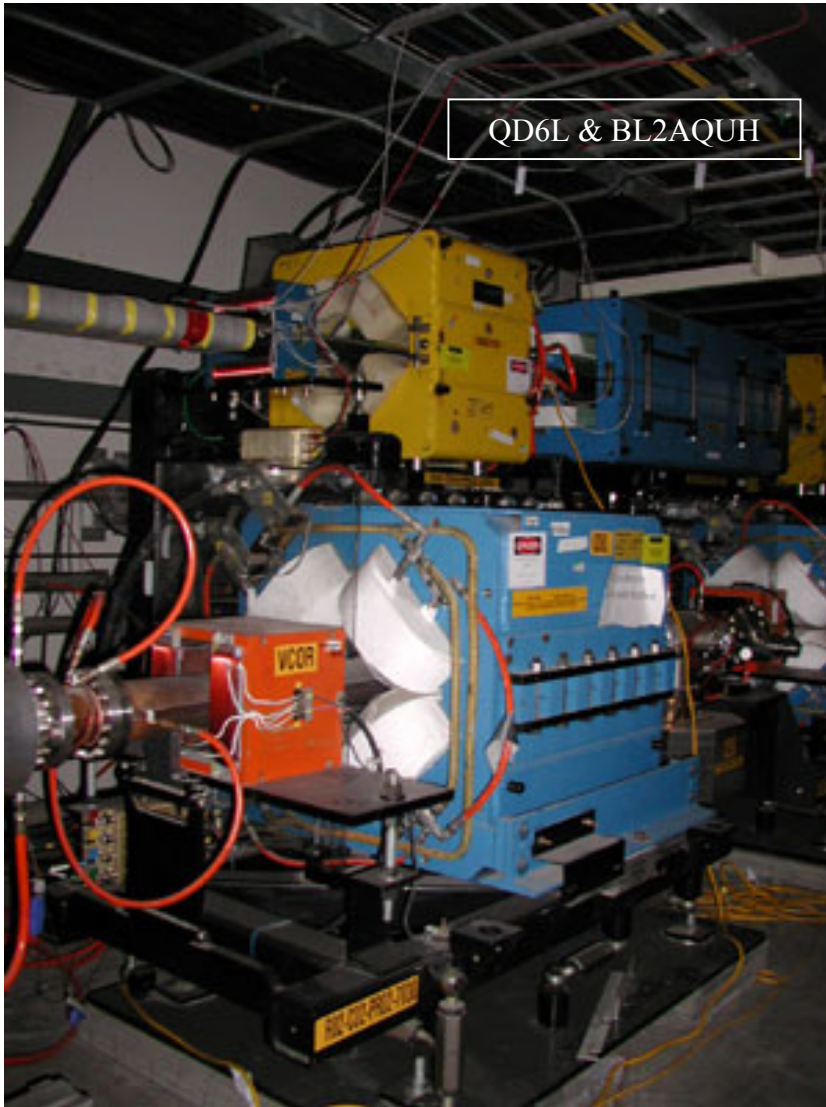
IR2 Network

July 01-12, 2002

- BaBar Network:
 - 19 monuments.
 - 4 magnets (Q4 and Q5 on both A and B side).
- A Side:
 - 17 monuments.
 - 25 magnets (5 HER, 20 LER).
- B Side:
 - 21 monuments.
 - 23 magnets (5 HER, 18 LER).

Magnets Layout A Side



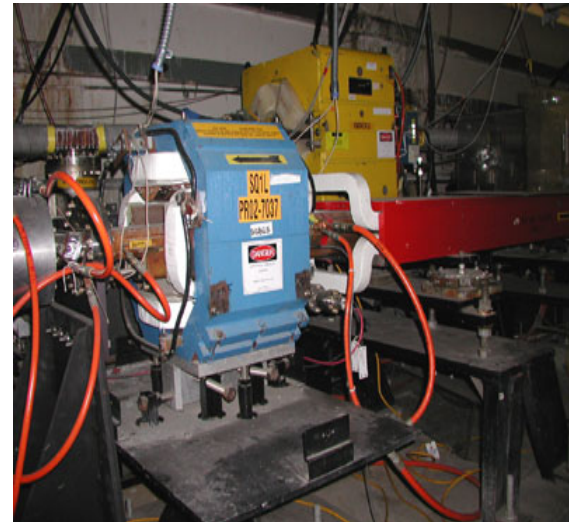


QD6L & BL2AQUH



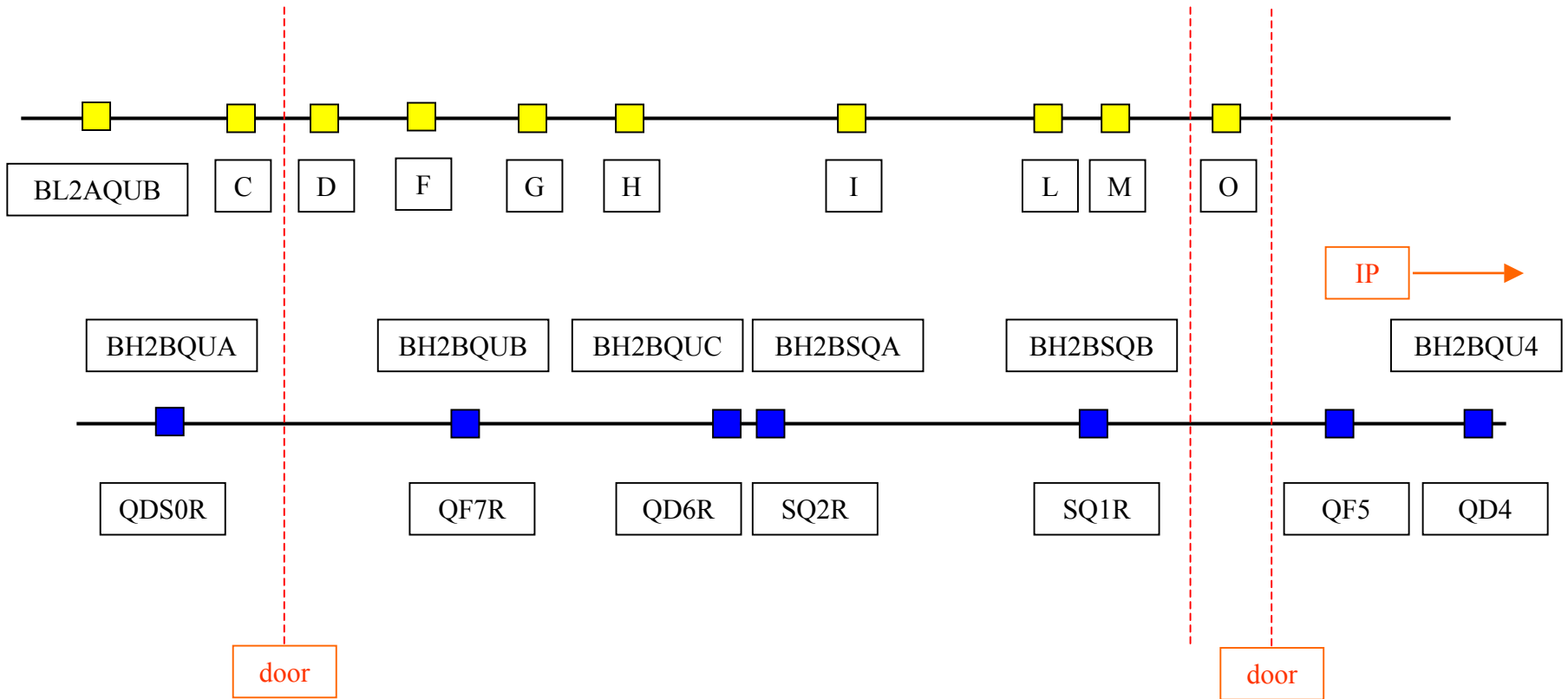
QDS0L &
BL2AQUB-C

A Side

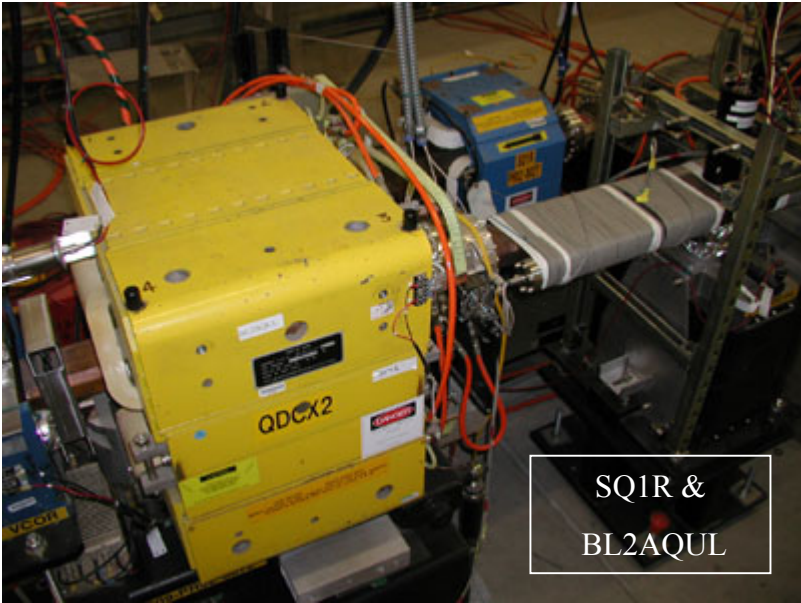


SQ1L &
BL2AQUJ

Magnets Layout B Side



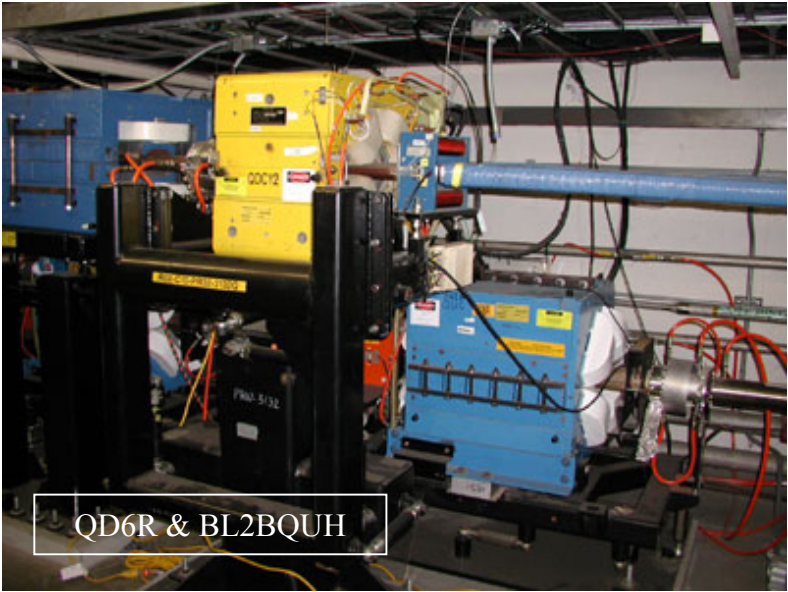
B Side



SQ1R &
BL2AQUL



QDS0R & BL2AQUB-C



QD6R & BL2BQUH

Network Description

- 47 Tracker Stations
- 378 Reference Points
- 1281 Triplet Observations
Distance $40 \mu\text{m}$, horizontal angle $30 \mu\text{m} / D$, vertical angle $50 \mu\text{m} / D$
- 163 Height differences
Height difference $50 \mu\text{m}$

Network Results

- Variance Analysis
 - degree of freedom 2594
 - sigma a posteriori 0.778010
(distance: 0.802302, horizontal angle: 0.768191,
vertical angle: 0.709557, height difference: 1.040546)
- Normalized Residuals
 - pass the Chi2 goodness of fit test

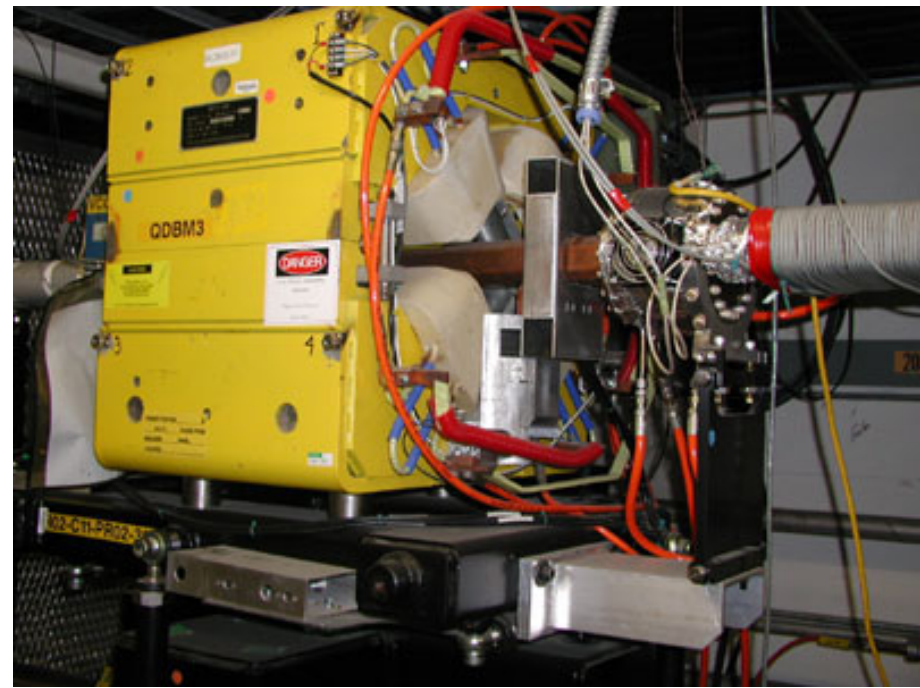
LER BPMs Facts

- 14 on each side, one near each quad.
- Center at 14 inches US or DS of the quad center.
- **No fiducial.** Use the neighboring flanges to get position (except when vertical bend in the way).
- Flanges located from 10 to 120 inches!

2 BPMs on B Side



BL2CQUC or QFBM4



BL2CQUD or QDBM3

LER BPMs Survey

- TC2002 set-up for 1 to 3 BPMs
 - 4 monuments minimum.
 - 1TB on the referencing quad.
 - 1 X-shot and 1 Y-shot at each flange.
- 16 Stations generating 255 triplets
 - Distance: 250 μm
 - Horizontal and Vertical Angles: 50 $\mu\text{m} / \text{D}$

Processing Steps

- Combine TC2002 observations to existing IR2 network.
- Transform flange results into a beam following system centered at the corresponding quad.
- Correct for specific offsets (flange radius, extension arm...) to get the center of each flange.
- Reduce US and DS flange results to get the center of the BPM.

BPM_LBQD part 1

Adjustment Results				Ideal Positions		
BL2BQUDM				50321.410990	70121.943080	2066.884270
BL2BQUD	50321.634543	70122.298651	2067.161076	50321.630960	70122.298610	2067.160180
BL2BQUD	50321.833861	70121.921923	2067.153680	50321.830280	70121.921940	2067.152770
BL2BQUD	50321.833949	70121.921950	2066.759799	50321.830400	70121.921970	2066.758890
BL2BQUD	50321.635249	70122.298551	2066.759437	50321.631700	70122.298570	2066.758560
LBQDFDX	50321.541736	70122.539905	2066.878373			
LBQDFDY	50321.200707	70122.353798	2066.989232			
LBQDFUX	50322.215427	70121.262426	2066.887481			
LBQDFUY	50321.872016	70121.085685	2066.989732			
6 Parameter Transformation Results				Differences from quad center in global system		
LBQDFDX	50321.538160	70122.539910	2066.877500	0.127170	0.596830	-0.006770
LBQDFDY	50321.197130	70122.353780	2066.988310	-0.213860	0.410700	0.104040
LBQDFUX	50322.211900	70121.262450	2066.886540	0.800910	-0.680630	0.002270
LBQDFUY	50321.868480	70121.085690	2066.988750	0.457490	-0.857390	0.104480
Differences (in inch) from quad center in beam following system (yaw = -62.1246338, 3389134 deg)						
LBQDFDX	-18.430	15.412	-0.267			
LBQDFDY	-18.230	0.117	4.096			
LBQDFUX	38.430	15.344	0.089			
LBQDFUY	38.260	0.139	4.113			

BPM_LBQD part 2

- Offsets Removal

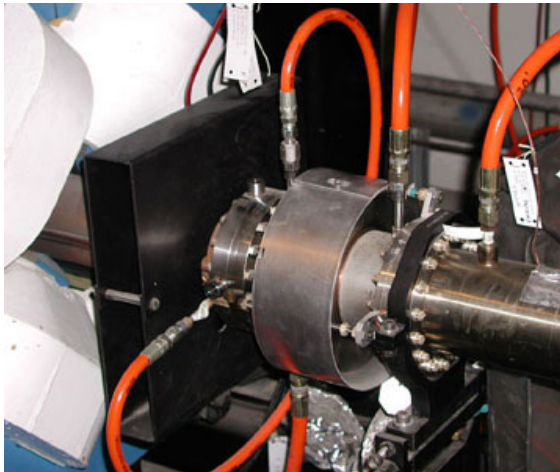
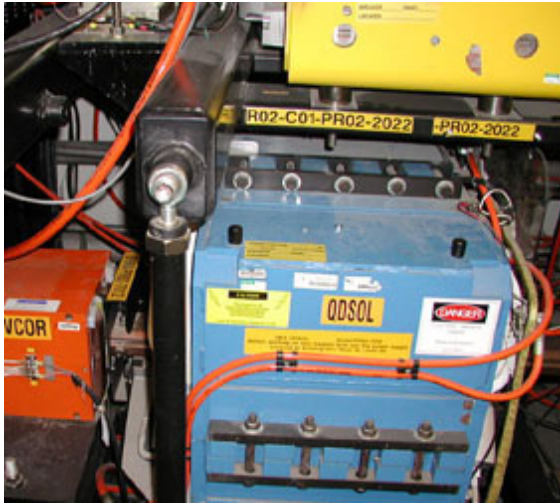
LBQDFUX	38.430	15.344	0.089	3.365		0.750		11.250				-0.021	
LBQDFUY	38.260	0.139	4.113		3.365		0.750		0.000	0.00000			-0.002
LBQDFDX	-18.430	15.412	-0.267	3.365		0.750		11.250				0.047	
LBQDFDY	-18.230	0.117	4.096		3.365		0.750		0.000	0.00000			-0.019



- Center Calculation

	Z inch	X inch	Y inch
LBQDFU	38.345	-0.021	-0.002
LBQDFD	-18.330	0.047	-0.019
BPM_LBQD	-14.000	0.042	-0.018

HER BPMs



IR2 BPMs 2002 Positions (wr to the corresponding quad)													
		X (inch)	Y (inch)	US Dist	DS Dist			X (inch)	Y (inch)	US Dist	DS Dist		
BPM_LAQB	QDBM5L	-0.012	0.007	-14.50	26.44	BPM_LBQO	QFCX1	0.037	0.039	12.01	27.89		
BPM_LAQC	QFBM4L	0.044	0.010	-13.51	28.11	BPM_LBQN	QDCX2	0.042	-0.092	-23.20	68.38		
BPM_LAQD	QDBM3L	0.001	-0.018	-38.41	17.67	BPM_LBQM	QFCX3	-0.065	0.004	-15.94	16.18		
BPM_LAQE	QFBM2L	0.026	-0.001	-105.57	14.10	BPM_LBQL	QDCX2	0.064	-0.037	-15.26	61.29		
BPM_LAQF	QDBM1L	0.001	-0.041	-14.06	46.75	BPM_LBQK	QFCX1	-0.066	-0.042	-24.35	13.27		
BPM_LAQG	QFCY1	0.034	-0.012	-68.96	15.80	BPM_LBQJ	QFCY1	-0.003	-0.002	-53.91	16.02		
BPM_LAQH	QDCY2	-0.011	-0.019	-16.51	118.72	BPM_LBQI	QDCY2	-0.006	-0.034	-16.57	48.16		
BPM_LAQI	QDCY2	0.014	0.013	-47.50	16.49	BPM_LBQH	QDCY2	-0.033	-0.064	-119.14	16.94		
BPM_LAQJ	QFCY1	-0.032	0.007	-15.94	53.66	BPM_LBQG	QFCY1	-0.036	-0.036	-15.90	17.17		
BPM_LAQK	QFCX1	-0.004	-0.012	-12.91	24.31	BPM_LBQF	QDBM1	-0.001	-0.004	-46.41	14.30		
BPM_LAQL	QDCX2	0.009	0.032	-104.66	14.95	BPM_LBQE	QFBM2	0.025	0.004	-13.66	105.45		
BPM_LAQM	QFCX3	0.013	-0.004	-16.44	16.13	BPM_LBQD	QDBM3	0.042	-0.018	-18.33	38.35		
BPM_LAQN	QDCX2	0.029	-0.001	23.24	11.87	BPM_LBQC	QFBM4	0.007	0.075	-28.08	13.34		
BPM_LAO	QFCX1	0.040	0.010	-27.97	-11.63	BPM_LBQB	QDBM5	-0.002	0.072	-26.61	14.76		
BH2AQUA	QDS0L	0.026	-0.016			BH2BQUC	QD6R	0.014	0.000				
BH2AQUB	QF7L	0.019	-0.052			BH2BQUB	QF7R	0.005	-0.007				
BH2AQUC	QD6L	0.016	-0.043			BH2BQUA	QDS0R	0.002	-0.013				