E-lens related beam-beam experiment

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a passion for discovery
Office of Science
U.S. DEPARTMENT OF ENERGY

1 IP10 -- e-beam collision with proton only (up to 800mA e-beam with 100 mA / step)

2 IP10 + IP6 + IP8

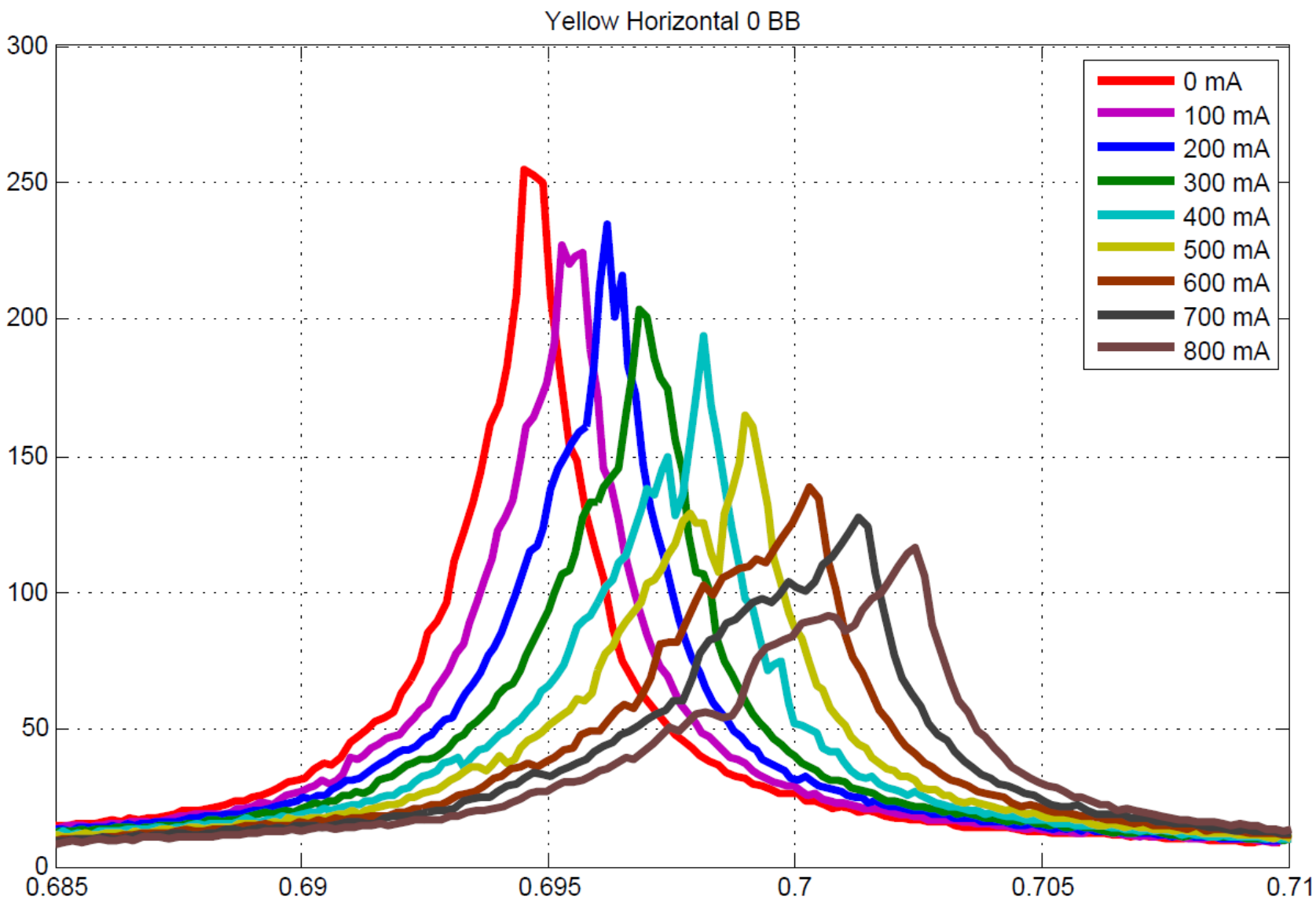
3 IP10 + IP8

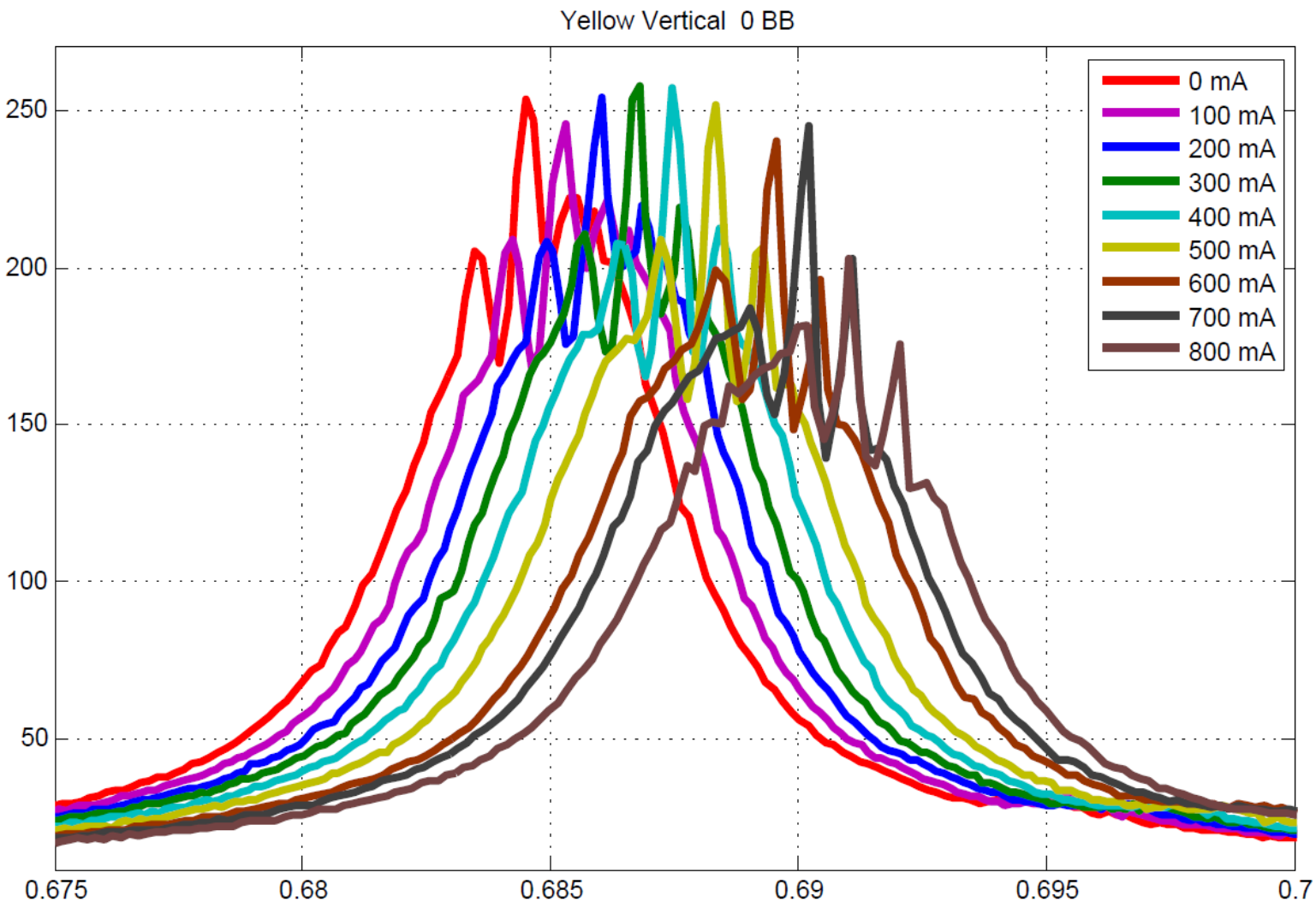
4 IP10 -- 1D horizontal separation scan with 700 mA beam from 2mm to -4.5 mm (0.5 mm/step)

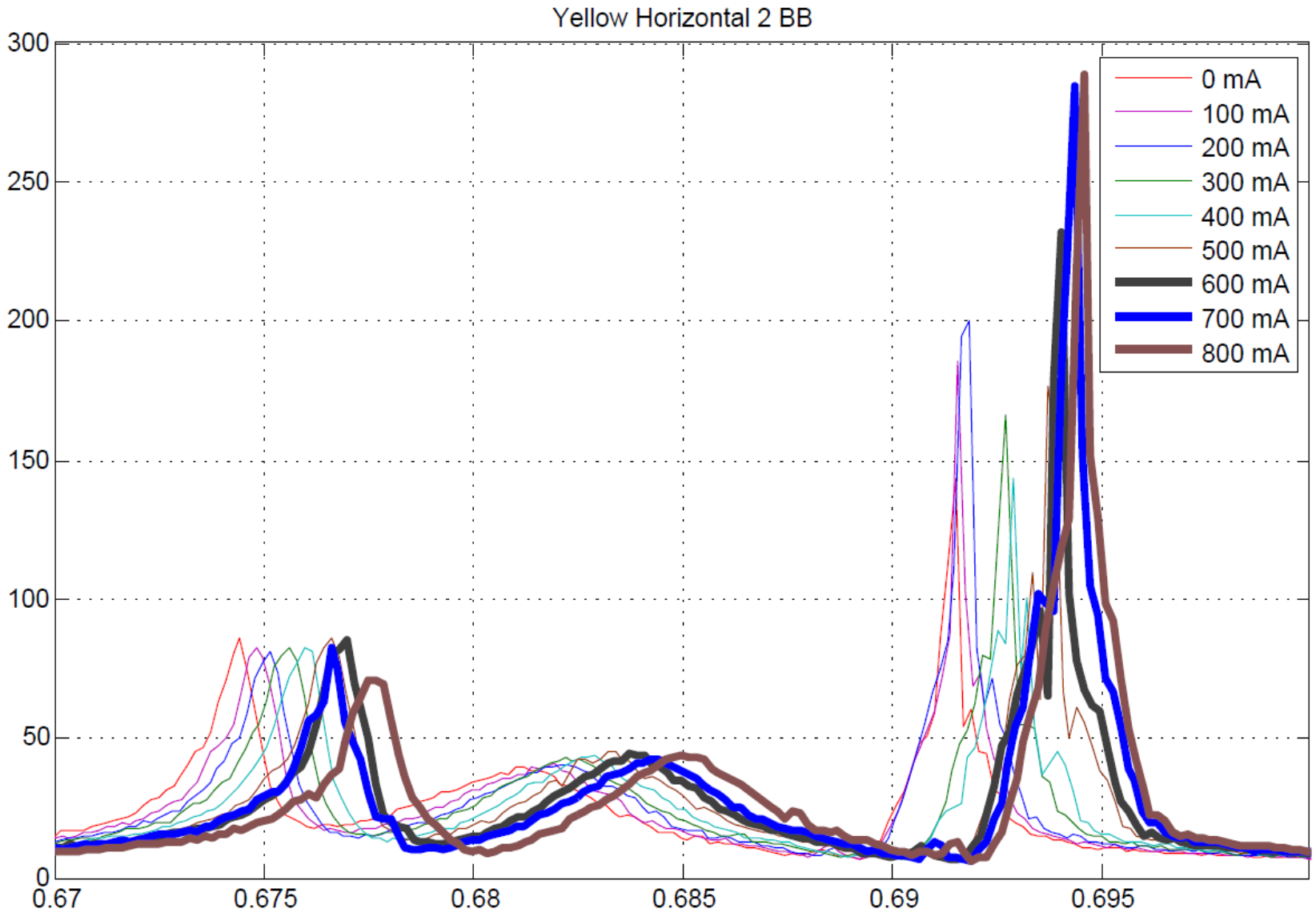
5 Current vs Emittance

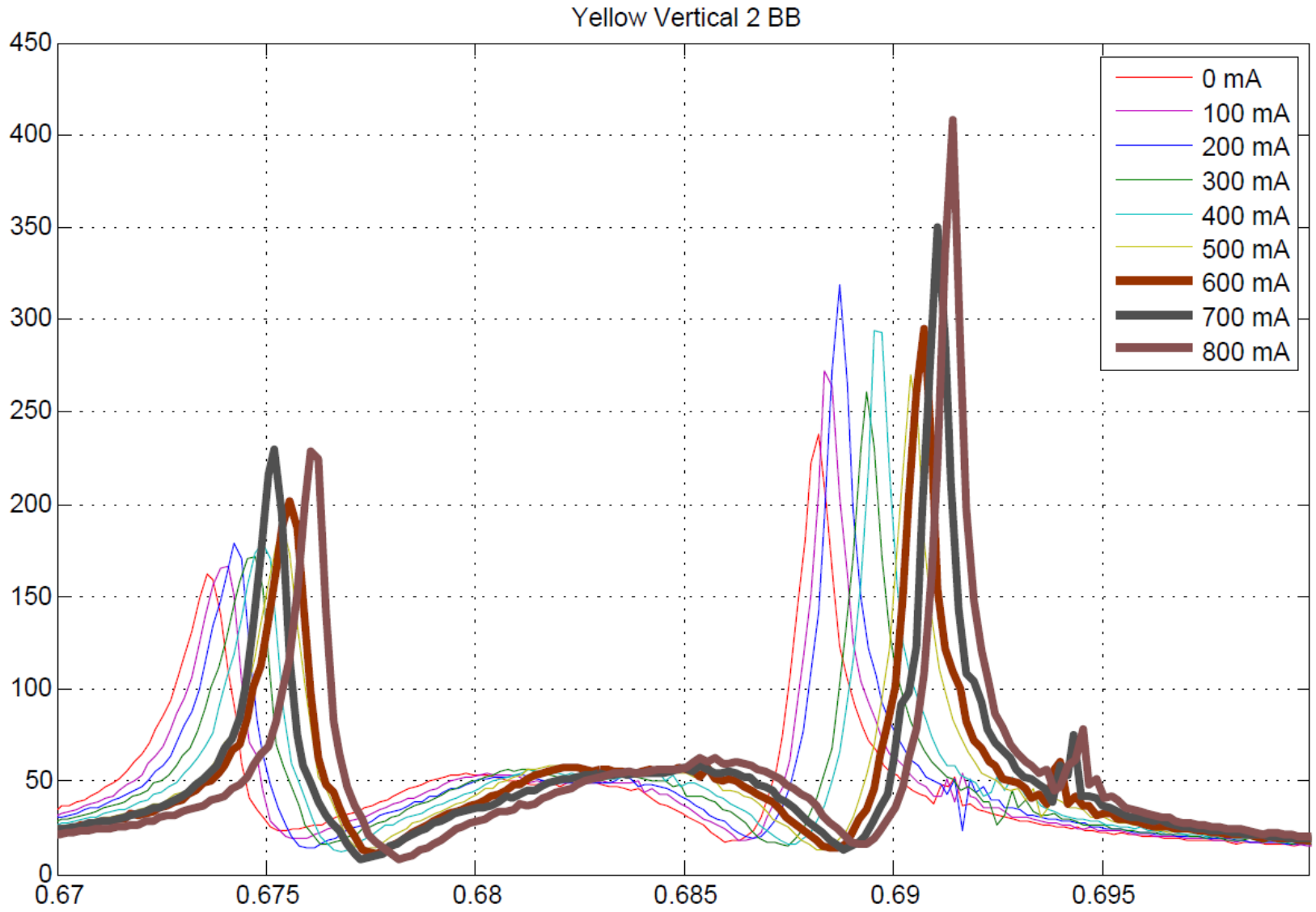
6 Yun, Michiko, Al, Wolfram, MCR, Xiaofeng Gu

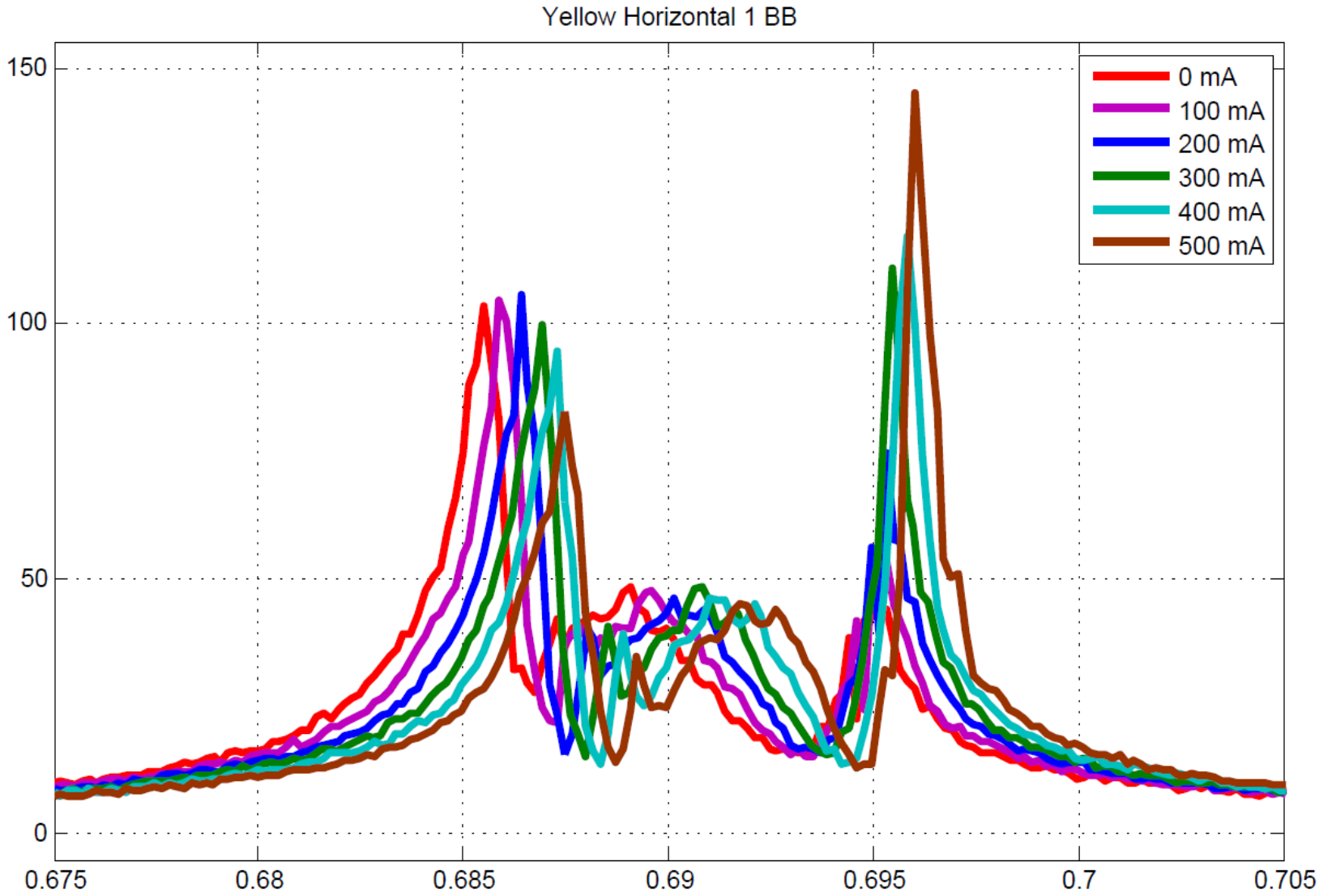
courtesy of V.Shiltsev

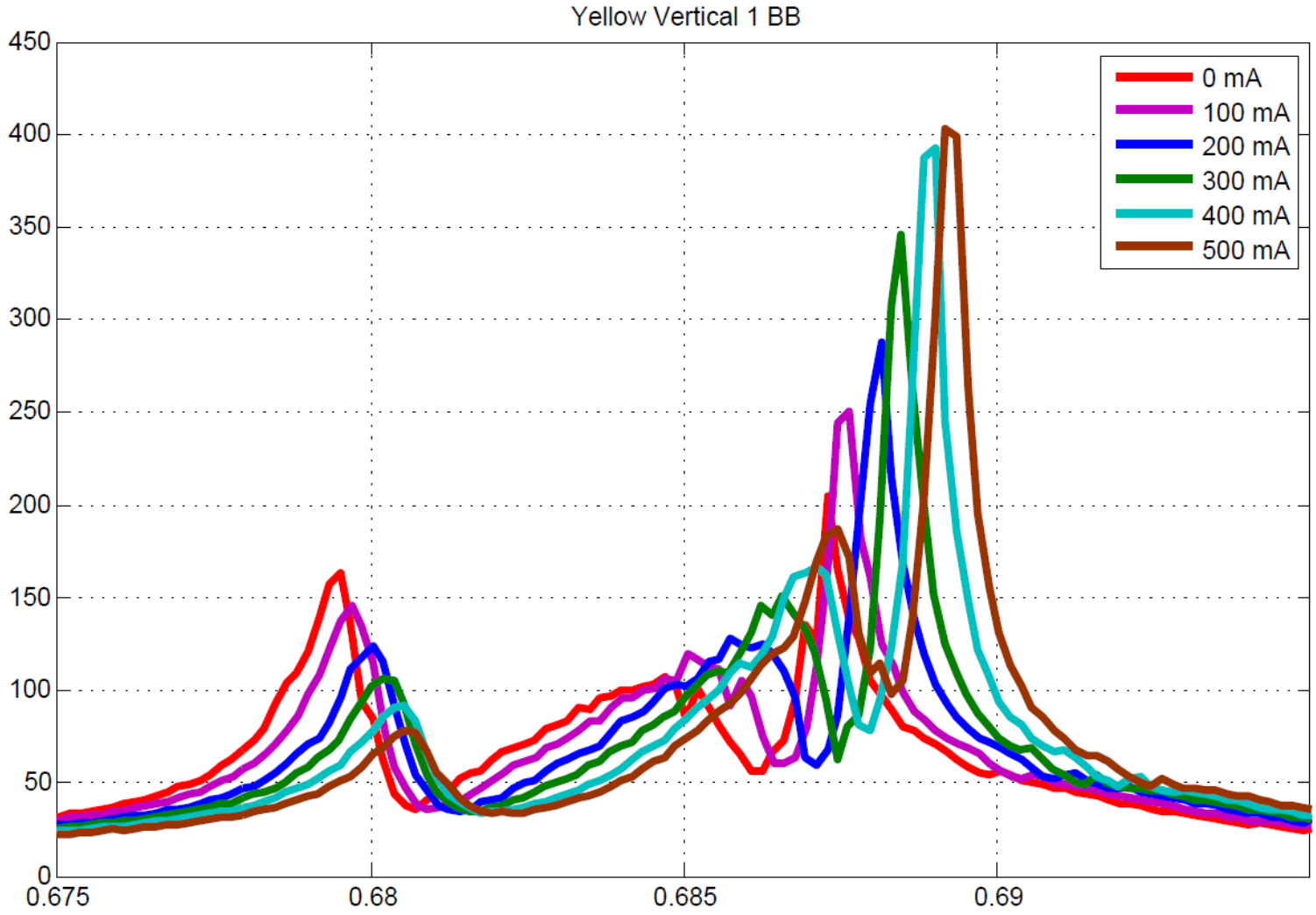

Yellow Horizontal 0 BB
300
250
200
150
100
50
0
0.685
0.69
0.695
0.7
0.705
0.71
0 mA
100 mA
200 mA
300 mA
400 mA
500 mA
600 mA
700 mA
800 mA


Yellow Vertical 0 BB
250
200
150
100
50
0.675
0.68
0.685
0.69
0.695
0.7
0 mA
100 mA
200 mA
300 mA
400 mA
500 mA
600 mA
700 mA
800 mA


Yellow Horizontal 2 BB
300
250
200
150
100
50
0
0.67
0.675
0.68
0.685
0.69
0.695
0 mA
100 mA
200 mA
300 mA
400 mA
500 mA
600 mA
700 mA
800 mA


Yellow Vertical 2 BB
450
400
350
300
250
200
150
100
50
0
0.67
0.675
0.68
0.685
0.69
0.695
0 mA
100 mA
200 mA
300 mA
400 mA
500 mA
600 mA
700 mA
800 mA


Yellow Horizontal 1 BB
150
100
50
0
0.675
0.68
0.685
0.69
0.695
0.7
0.705
0 mA
100 mA
200 mA
300 mA
400 mA
500 mA


Yellow Vertical 1 BB
450
400
350
300
250
200
150
100
50
0
0.675
0.68
0.685
0.69
0 mA
100 mA
200 mA
300 mA
400 mA
500 mA

1 Alignment tuning
2 E-beam current and tune measurement with BTF and

0 bb collision e-lens only (0, 100, 200, 300, …, 700 mA)

1 bb collision + e-lens (0, 100, 200, 300, …, 700 mA)

2 bb collisions + e-lens (0, 100, 200, 300, …, 700 mA)

3 E-beam energy vs Tune measurement (4kV, 4.5kV, 5kV, 5.5 kV, 6kV) (if we have time)
4 E-beam size vs Tune measurement (if we have time)
5 1D beam separation vs Tune (if we have time)

courtesy of V.Shiltsev