EMA beamline at Sirius:

Extreme condition x-ray Methods of Analysis

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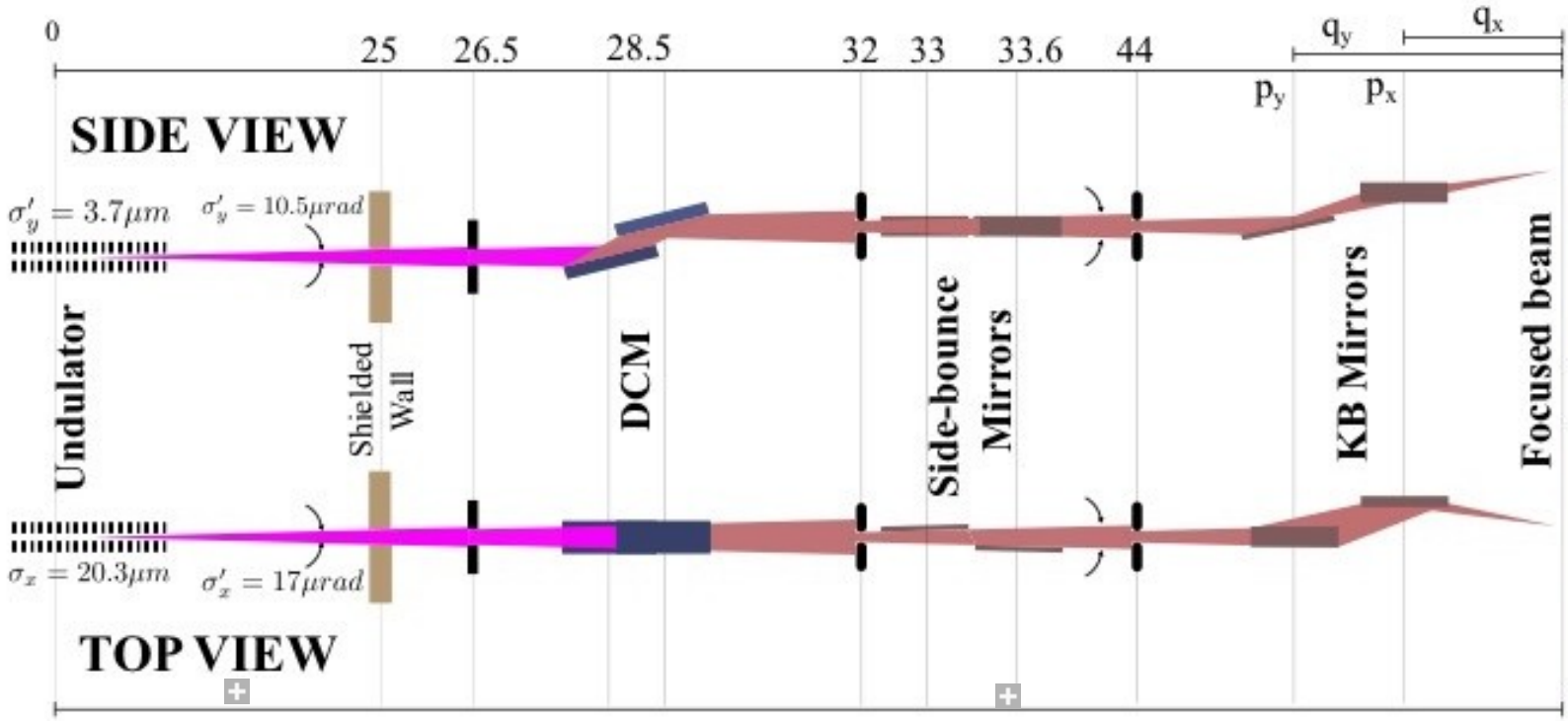
Direct focusing scheme



KB Mirrors 1: Magnet hutch

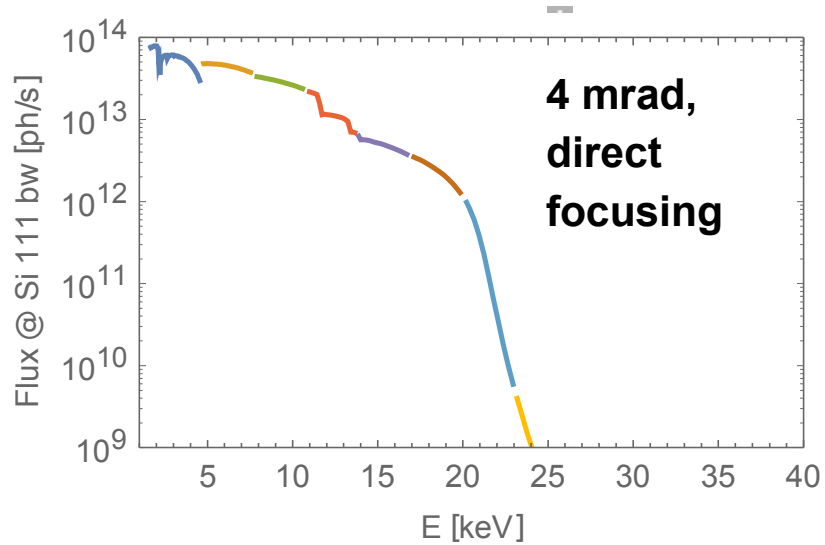
$p_y = 44.8$ m $p_x = 45.2$ m
$q_y = 2$ m $q_x = 1.6$ m

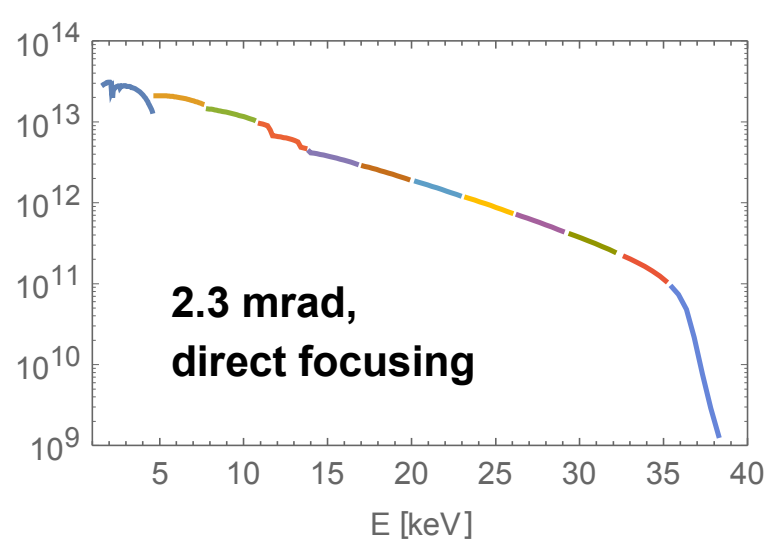
$\Sigma_y = 1.9$ µm $\Sigma_x = 1.0$ µm
$\Sigma_y' = 0.2$ mrad $\Sigma_x' = 1$ mrad

KB Mirrors 2: Laser hutch

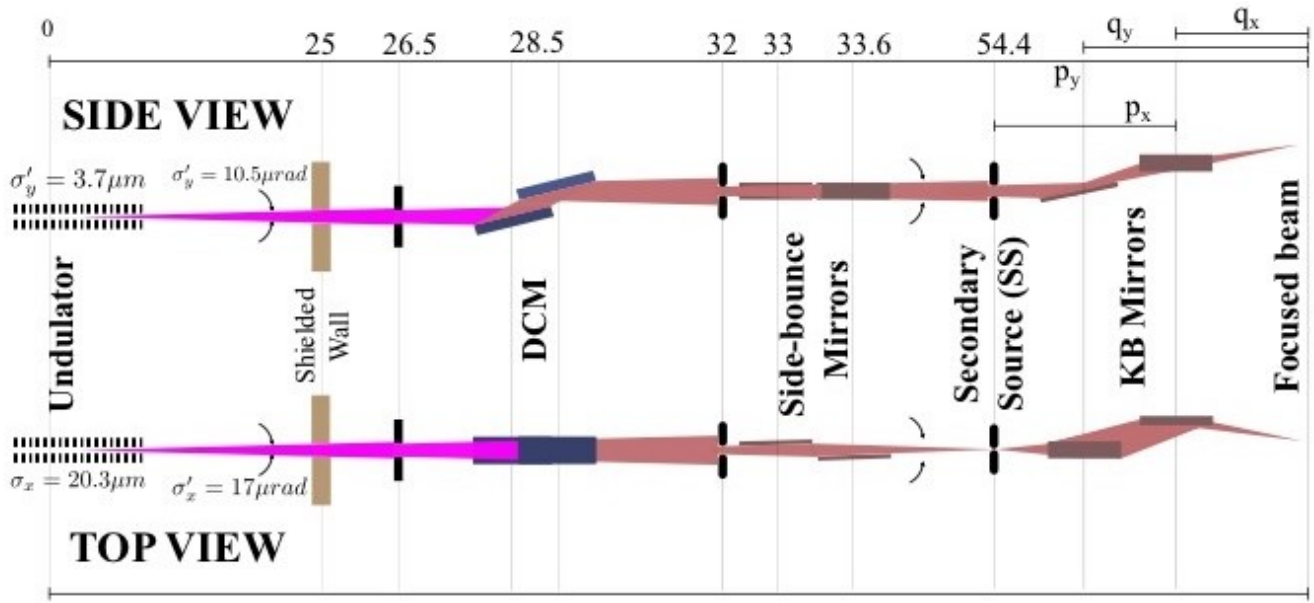
$p_y = 87.5$ m $p_x = 87.8$ m
$q_y = 1$ m $q_x = 0.7$ m

$\Sigma_y = 0.48$ µm $\Sigma_x = 0.50$ µm
$\Sigma_y' = 0.4$ mrad $\Sigma_x' = 3.8$ mrad





Secondary source focusing



KB Mirrors 2: SS focusing

$p_y = 87.5$ m $p_x = 33.4$ m
$q_y = 1$ m $q_x = 0.7$ m

$\Sigma_y = 0.48$ µm $\Sigma_x = 0.35$ µm
$\Sigma_y' = 0.4$ mrad $\Sigma_x' = 0.7$ mrad

- If the experiment needs round divergence
- Over illumination improves stability
- There is a compromise in flux (a factor of 10 at least)

KB + Secondary source		Horiz. (Bender)		Vert. (Bender)	
Slope error (µrad):		0.1		0.1	
Length (m)		0.3		0.3	
Source to mirror (m):		33.4		87.5	
Angle (mrad):		4		4	
acceptance (µm):		1200.0		1200.0	
acceptance (#of σ):		2.00		1.52	
beam intensity acceptance:		0.683		0.553	
Size and divergence (FWHM):		Σx	Σx'	Σy	Σy'
Units:		µm	µrad	µm	µrad
Vert. Mirror (m):	87.5	3685	49.4	1855	24.8
Hor. Mirror (m):	33.4	1410	49.4	714	24.8
focal position (m):	88.2	0.20	1252	0.34	646
	88.5	0.35	716	0.48	452
	90	1.1	228	1.2	181
	95	3.6	70	3.6	60
	97	4.5	54	4.6	48
	100	6.0	41	6.0	36